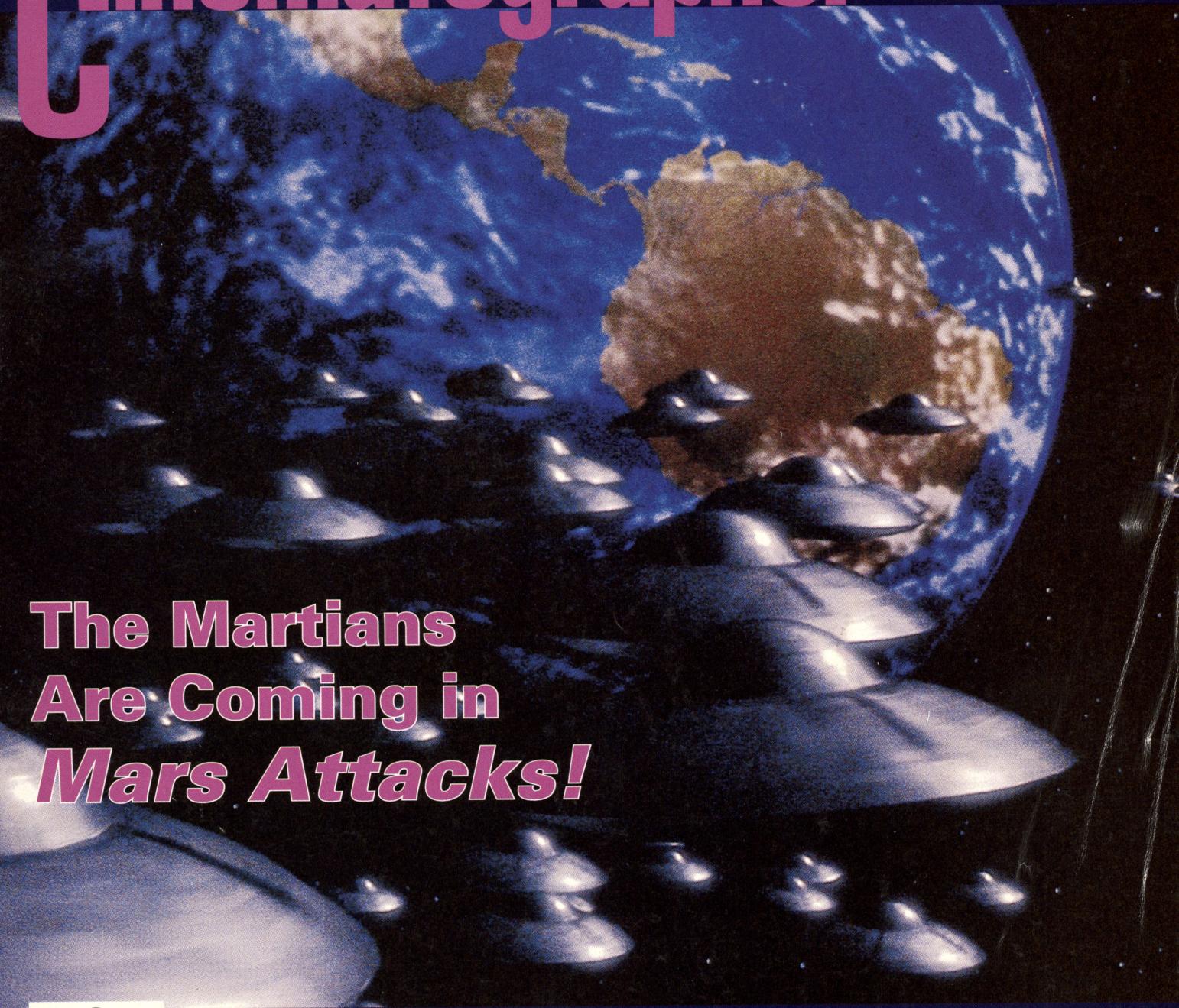


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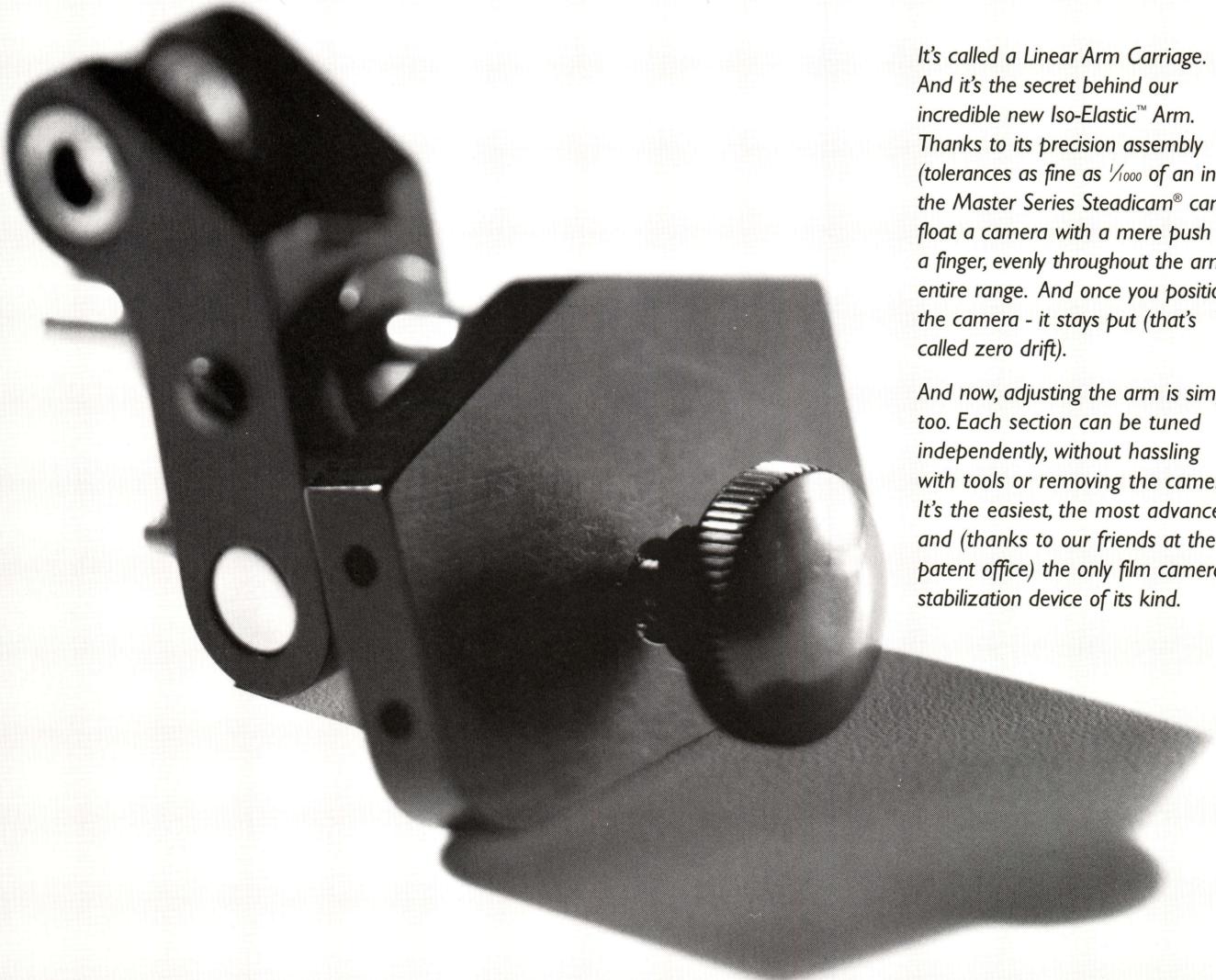
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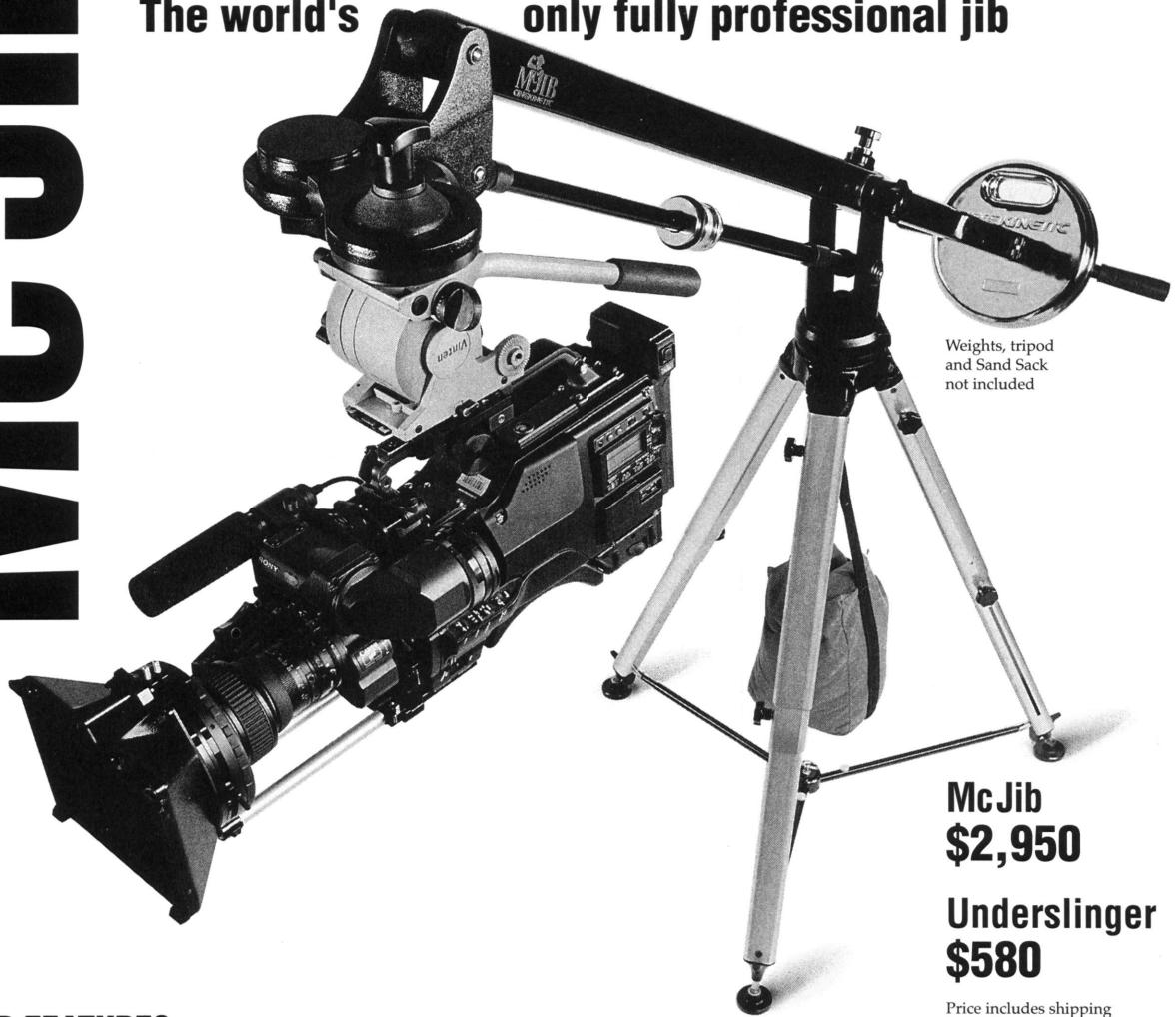
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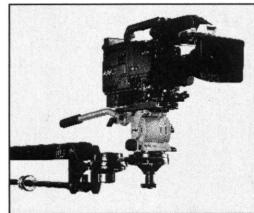
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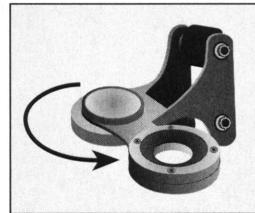
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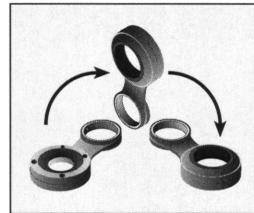
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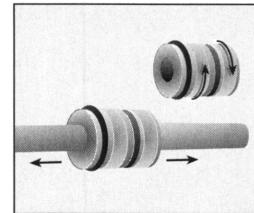
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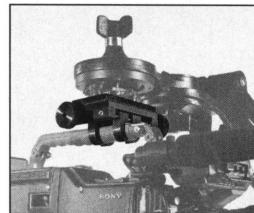
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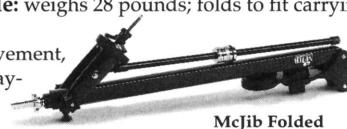


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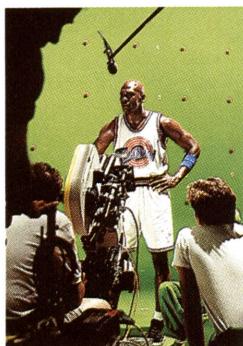
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Features

58

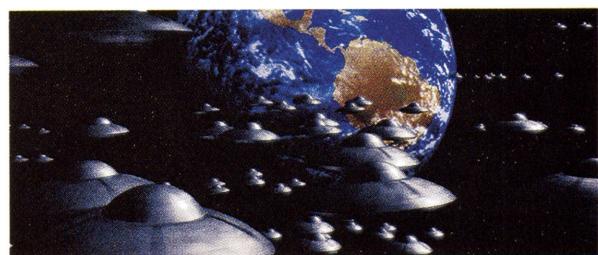


85

- 30 Argentine Diary**
A behind-the-scenes account of TNT's *The Man Who Captured Eichmann*
- 40 Galactic Antics**
Mars Attacks! adds camp spin to alien invasion
- 50 Strange Invaders**
Effects enhance lunacy of *Mars Attacks!* scenario
- 58 Battling the Borg**
Interstellar war erupts in *Star Trek: First Contact*
- 68 Where No Trek Has Gone Before**
Latest film in series tries some new digital tricks
- 75 Seeing is Believing**
AC's annual roundup of the year's most stunning special effects
- 76 Twister Kicks Up a Storm**
ILM creates "natural" disaster in digital realm
- 82 Making Mission Possible**
CG shots adrenalize spy thriller's climax
- 84 Jaw-Dropping Effects Add Heft to *The Nutty Professor***
Rhythm & Hues morphs Eddie Murphy
- 85 Space Jam: A Special Effects Slam-Dunk**
Cinesite takes Michael Jordan to Toon Town
- 91 Bluescreen/Greenscreen 101**
Experts detail photographic techniques for successful matte-work
- 99 A Cinematic Melting Pot**
Highlights from the Toronto Film Festival
- 106 Joseph August, ASC's Swan Song: *Portrait of Jennie***
Accomplished cinematographer caps fine career

Departments

- 10 Letters**
- 14 Digital Perspectives**
- 18 Production Slate**
- 111 On the Spot**
- 113 New Products**
- 124 Points East**
- 123 Books in Review**
- 125 Classified Ads**
- 129 Ad Index**
- 130 1996 AC Index**
- 134 In Memoriam**
- 135 From the Clubhouse**
- 136 ASC Members Roster**



On Our Cover: A swarm of Martian saucers descends upon Earth in a scene from *Mars Attacks!*, a new sci-fi comedy from director Tim Burton (digital composite courtesy of Mike Fink and Warner Digital Studios).

Contributing Authors: Jan Alan Henderson, Christopher Probst, Robert Steadman, ASC



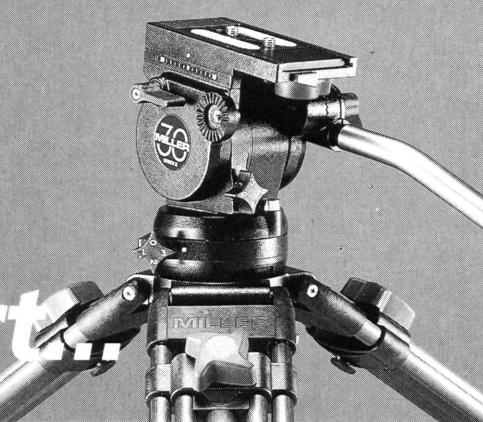
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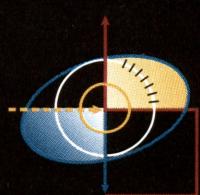
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It’s a 35mm Mitchell GC, modi-
fied and updated to our specs by
Fries Engineering. Manufac-
tured during the late Fifties but
never used. When we bought
these two, film had never been
run through them.

GC means Government Camera.
Mitchell built three of this low-
profile model, for the U.S. Navy.
Jacques Cousteau uses one;
we have the other two.

Pin-registered high-speed movement, 200 foot loads

The original camera has a regis-
tration-pin movement that can
run at up to 120 fps, a 200 ft mag-

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magazine takes darkroom
loads. As you can see, it mounts
on the rear. As you can also
see, so does the motor.

Reflex viewing, video tap, PL mount

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Non-adjustable 180° shutter. The
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no height; the viewfinder rotates
through 360°. PL lens mount;
the lens on the camera here is a
Zeiss 85mm T2.1.

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Height compared with other cameras:

With video tap, our Mitchell GC is $6\frac{3}{4}$ inches tall. That's $1\frac{3}{4}$ inches lower than an Eyemo, $5\frac{3}{4}$ inches lower than an ARRI 35-3 with shoulder magazine and video tap, $8\frac{3}{4}$ inches lower than a 35BL with its video tap.

Other specs:

It's $11\frac{1}{2}$ inches wide with video tap and viewfinder, $8\frac{1}{2}$ inches wide without viewfinder. Without lens, it's 28 inches long and weighs 35 pounds. Camera base to lens axis is $3\frac{3}{8}$ inches; lens axis to top of camera is the same. (On the BL and the Type 3, camera base to lens axis is $4\frac{1}{8}$ inches.)

For flying: two sockets

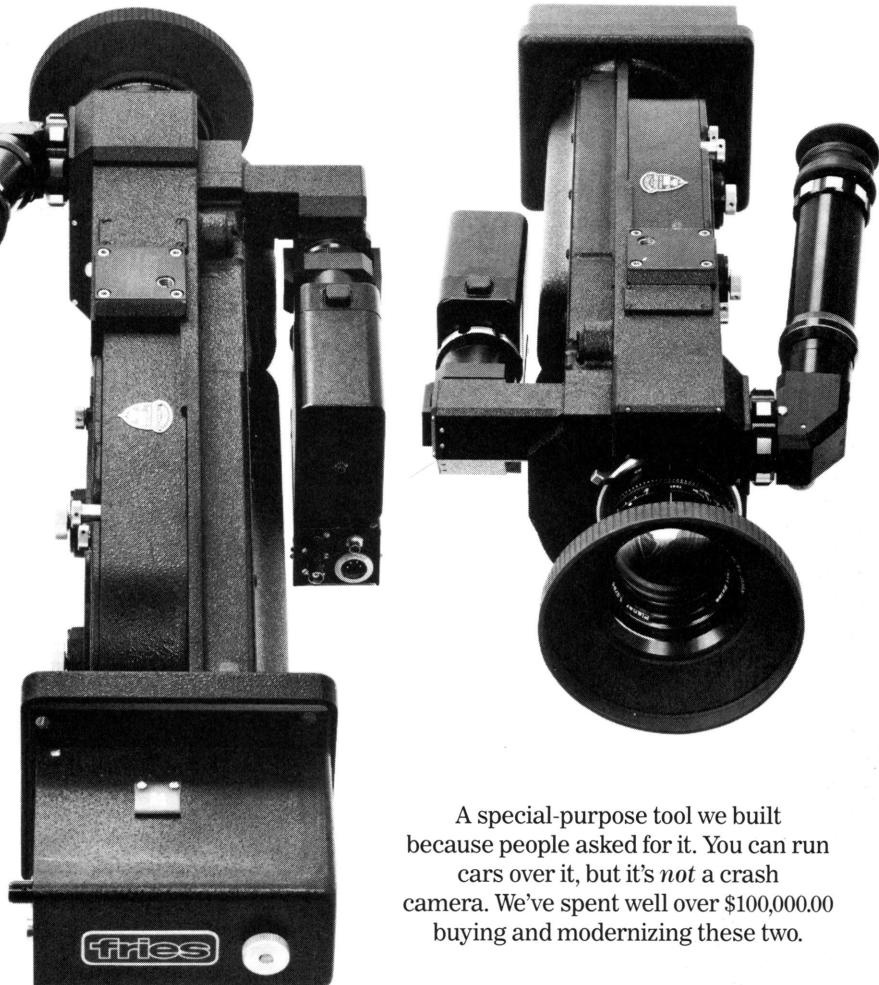
Obviously, this camera is a natural for flying through tight spaces—car windows, for example. To make it easier to fly, we've installed two standard tripod sockets on the camera: one on the bottom, one on the top.

Camera driven over by a car

Before we took these pictures of this GC camera, Director of Photography Bob Steadman drove a car over it for an Oldsmobile commercial. First Assistant Kim Guthrie and the crew made an indentation in the asphalt with an impact hammer and positioned the GC camera horizontally.

How low can you get this camera?

The ARRI Standard Mount Zeiss hard lenses (16, 24, 32, 50 and



A special-purpose tool we built because people asked for it. You can run cars over it, but it's *not* a crash camera. We've spent well over \$100,000.00 buying and modernizing these two.

85mm) all have barrels a hair over 2 inches in diameter. So there's a little over $2\frac{1}{4}$ inches between the bottom of those lenses and the GC camera base.

Top of camera $4\frac{1}{2}$ " above ground

If you position the camera with its base $2\frac{1}{4}$ inches below ground, the bottom of those Standard Mount lenses will be at ground level. The top of the camera

will then be almost exactly $4\frac{1}{2}$ inches above ground.

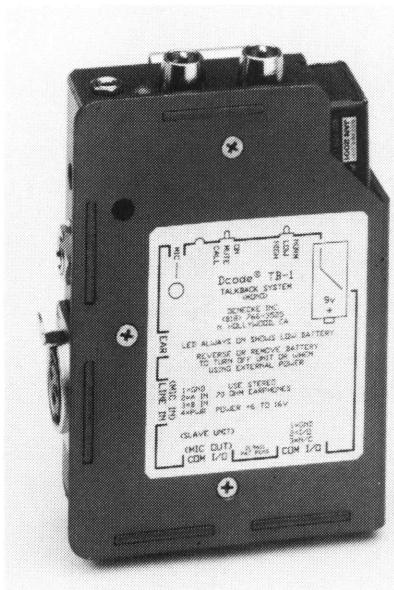
Std mount lenses on a PL mount camera?

The outside diameter on these Standard mount lenses is about an inch smaller than the PL mounts in the same focal lengths—so you can get the camera a half inch lower. If you're going to run a car over it, every little bit helps.

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Letters

Virtual Camera Rebuttal

In response to Dayton Taylor's article "Virtual Camera Movement" (Sep. '96), perhaps the reason for this sudden burst of publicity by Mr. Taylor is that he has been watching MTV pop promos and commercials by European directors over the past year or so. He will have the seen work by Emmanuel Carlier, Michel Gondry and myself, who have been producing work based upon what Taylor calls "virtual movement."

At the time of his patent application, there were already several multi-aperture rigs in existence, which predate his attempt by several years, the earliest date being 1981. The nature of these cameras is well in the public domain over here, and work produced with them has already been broadcast worldwide (including the U.S.).

The field is in a state of rapid technological evolution with a multiplicity of approaches to the same effects; the concentration here is on artistic applications by individual directors who have developed individual methods and "textures" for their films. To some extent, I think it a pity that Mr. Taylor has jumped on the facilities bandwagon and not applied himself to the more creative aspects of multi-aperture exposure; he gives written examples of what effects may be possible on his rig, effects which are already well under way and have been established by the aforementioned directors.

In terms of whose rig/system may be the best technically (ultimately a question of optics), and whether any aspect may be patentable (European laws are far more stringent) only time will tell. But as far as originality is concerned, perhaps Mr. Taylor should look more closely at pre-Spielberg film history, beginning with Muybridge, where he will find the original "virtual camera movement" system. The revolution now is in creative software; cameras are mere adaptive technology.

— Tim McMillan
Live from Bermuda Prods.
London, England

Dayton Taylor responds: With respect to Mr. McMillan's suggestion that the original virtual camera movement system was Muybridge's, I agree. But there was a non-obvious conceptual leap I had to make to get from Muybridge's invention to my own, which, like most conceptual leaps, is much more easily made in hindsight than in foresight. This leap was the realization that by recording a tracking shot with an array of cameras my system could produce a number of novel motion picture special effects.

To the best of my knowledge, my patent application predates all of the work Mr. McMillan speaks of in which tracking shots have recently been recorded with still camera arrays. As far as other multiphotographic systems or rigs go, camera and projector arrays have been developed throughout this century, most of them for stereophotographic techniques of recording subjects for stereo viewing systems. My patent application discusses over a dozen of these, the earliest dating back to 1965 (Clay, U.S. Patent No. 3,225,651).

With respect to the directors Mr. McMillan mentions as having developed their own "textures" for their films: these textures are actually artifacts which result from the specific software methods these directors use to overcome the minimum tracking speed limitations of the camera arrays they use. These methods belong to a class of software developed to time-stretch motion picture imagery, and are part of most commercially available postproduction software packages. My camera design, which was invented prior to the software revolution Mr. McMillan speaks of, minimizes the distance between lenses, thereby minimizing the need for these techniques and thus these artifacts.

Last Word on *The Sea Hawk*

In reference to Rudy Behlmer's excellent two-part article on *The Sea Hawk* (July/Aug. '96), the film was actually initially cut by some seven minutes for general release in 1940. At some point prior to the late Forties re-editing,



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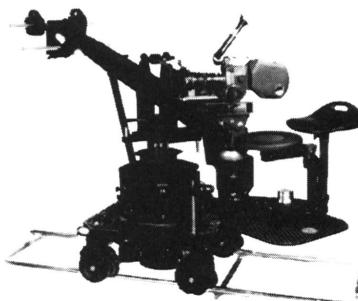
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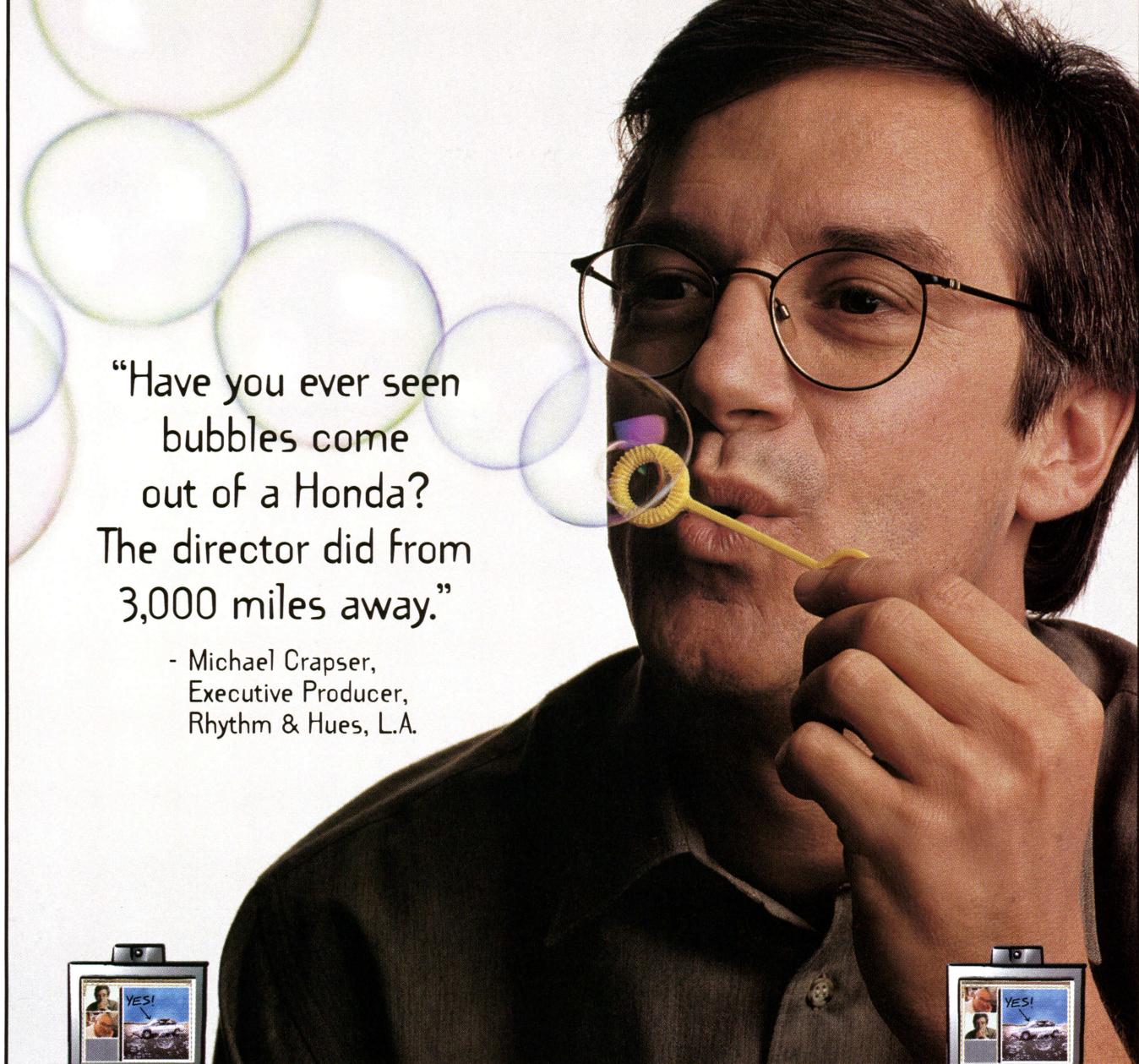
Warners made a 16mm printing element on this version, possibly a 35/32 dupe negative, which was used for nontheatrical and syndication prints up until the mid-Seventies. In 1973 at USC, I saw a 16mm print which included the scenes excised in the late Forties: part of the opening with Philip of Spain, some banter among Thorpe's crew before the first sea battle, and most notably Dona Maria's unsuccessful coach dash to Dover to warn Thorpe that her uncle knows of his Panama plan. Incidentally, the leaders on this print dated the re-editing as being done in 1948. On current circulating 35mm prints, the Warners' logo is replaced by one for Dominant Pictures, a company to which Warners subcontracted the theatrical distribution of its older films.

And for the record, Warners' nitrate Technicolor IB studio print of *The Adventures of Robin Hood* (occasionally screened at properly equipped venues in the Seventies) was also from its 1948 reissue. Apparently, no original 1938 prints exist. This is a pity, since it would be interesting to see to what degree the vividness of color was dulled by the use of the black-and-white key image; this doesn't seem to have adversely affected the original reels of *La Cucaracha*, *Becky Sharp*, *The House of Rothchild* and *The Little Colonel* that I've seen. *Robin Hood*'s 1954 reissue was in black-and-white, as was the case with the Fifties' safety reprintings of many nitrate-era color films; the first 35mm safety color prints of *Robin Hood* were Eastman Positive prints made in Technicolor in 1976.

— Rick Mitchell
 Los Angeles, California

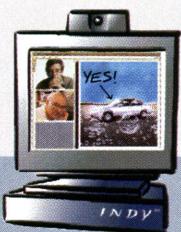
Errata

In Christopher Probst's October '96 article on *Millennium* ("Mining the Macabre") the show's current cinematographer, Rob McLachlan, was incorrectly identified as John McLachlan. AC regrets the error and will spend the rest of the century trying to make up for it.



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Digital Perspectives

The Virtual Studio

by Frank Beacham

When most of us think of a television studio, we think of a physical place that houses cameras, videotape recorders, switching consoles and all the other accoutrements that make up the modern video production factory.

This mindset is about to change. New computer networking technology, coupled with object-oriented software will soon allow the creation of a "virtual studio" where the entire production process can be controlled from geographically independent locations.

The concept of a studio without boundaries was described by Ken Guzik of Sun Microsystem's Technology Development Group at a recent presentation in Los Angeles before the SMPTE. Sun's research on the "virtual studio" is part of an advanced television technology program involving several broadcasting and computer companies at the David Sarnoff Research Center in Princeton, New Jersey.

The fusion of digital video technology, high-speed wide-area computer networks and digital file servers, said Guzik, allows broadcasters to view the future of television studios very differently than they do today. "What is beginning to evolve is the idea that the studio is no longer defined by the physical space it takes up, but by the accessibility of its network entry points," he said.

According to Guzik, the dramatic shift now underway from storing video on magnetic tape to file servers allows for a dramatic change in the nature of controlling studio operations. The architecture of the television studio shifts from a web of directly connected mechanical devices to a community of computers and peripherals that are linked together by a network.

The job of managing studio operations, Guzik said, becomes one of controlling these networked devices via a series of modular blocks of software

that can control all studio operations over networks that can extend to any location. Such component software methodology is called object-oriented programming.

"The basic idea is that software services are provided in terms of individual building blocks — classes — that can perform all of their logical operations on themselves and the data they contain," said Guzik. A simple example of this, he said, is a VCR class. In addition to knowing the tape format of the VCR, the block of software provides several operations that will control the basic functions of the deck. Each instance of this class, known as an "object," contains its own specific copy of the data.

"For example," said Guzik, "if I have two tape decks that accept tapes of different formats — say D1 and Beta — I can create two instances of class VCR, one that represents and controls the D1 tape deck, and the other that controls the Beta deck. This notion of objects containing their own data and the operations that can be performed on that data is known as 'encapsulation.' When looking at how object systems can link together to perform complex tasks, this idea becomes critically important."

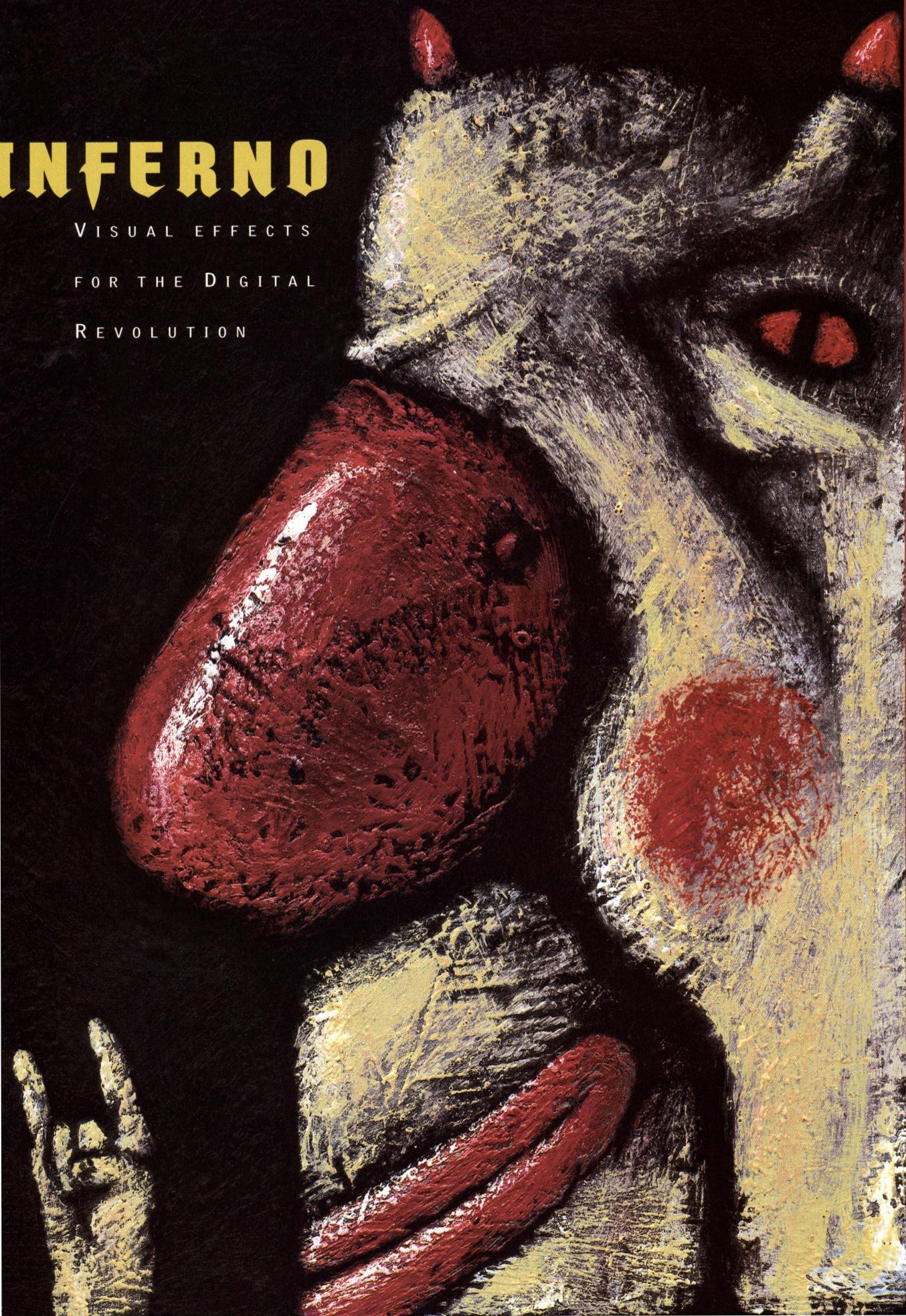
Another key attribute of classes, said Guzik, is their ability to inherit functionality from other classes. This idea is known as "subclassing." One can create a second class — say a "Timing VCR class" — that inherits all of the attributes of the VCR class, but adds an additional bit of functionality that starts and stops the VCR at specific times.

One could extend this idea and create subclasses of the Timing VCR class that add yet more functionality. With each successive subclass, only the new attributes need to be provided — everything else is inherited from the ancestor classes. This ability to add and change functionality without replication of effort is what makes object-oriented methodologies so compelling, said Guzik.

It's the ability to both inherit functionality from existing classes, and to use the functionality of existing objects, that will allow one to build very

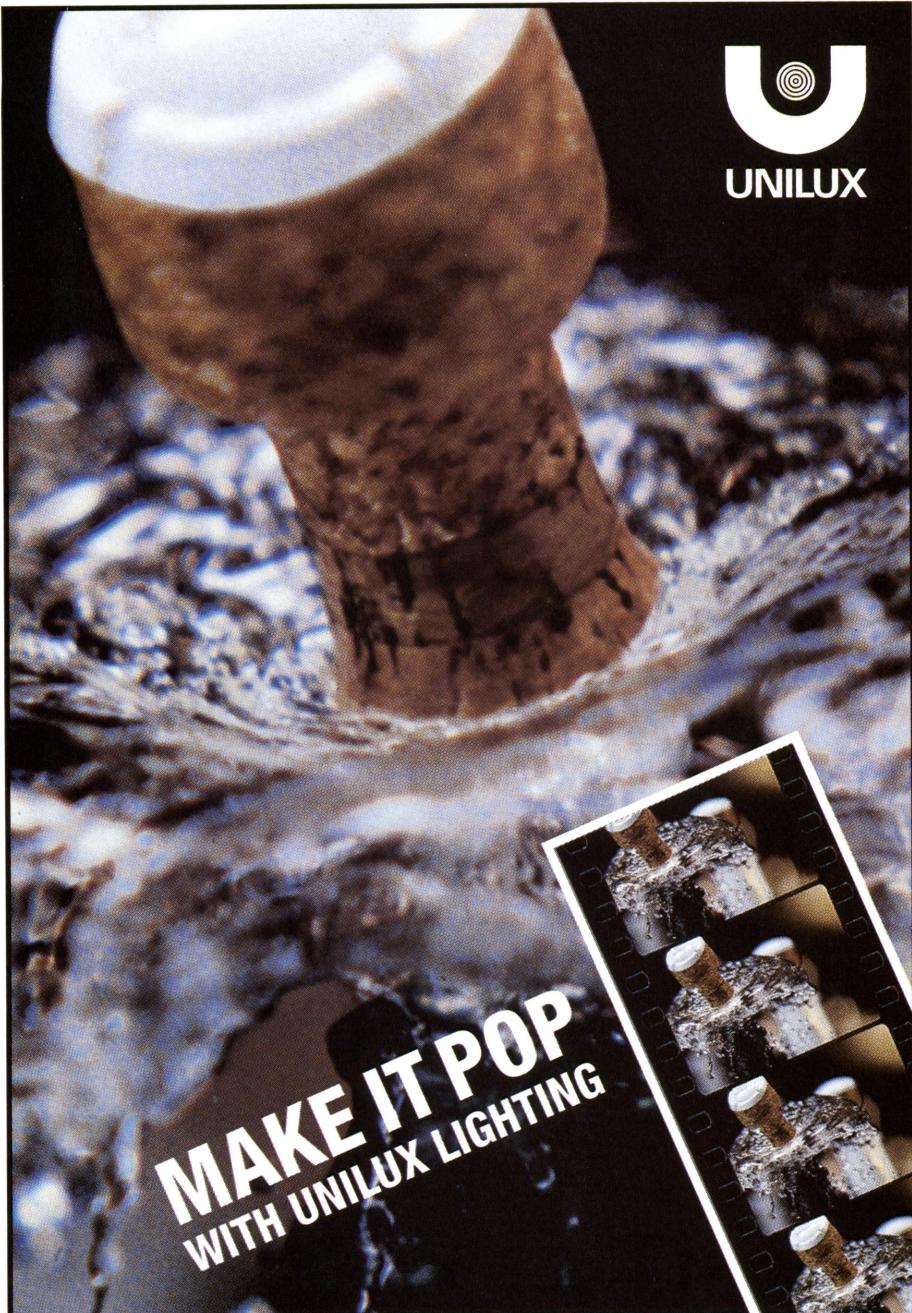
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large and complex studio systems that are easily maintained, easily enhanced, and flexible to change.

To help complete the picture, Guzik moved to the notion of a distributed-object system. Rather than have all the objects reside within the same physical environment — i.e. a single computer workstation — we can now open up this model and envision a system where objects reside on computers anywhere on the net and are still accessible to all other objects and software clients.

This can be accomplished, said Guzik, by creating a "registry" of objects on the network that knows the location and capabilities of all objects in the system. When a client wants to subclass an existing class, or wants to use an existing object, the registry will provide them with the information necessary to access their attributes.

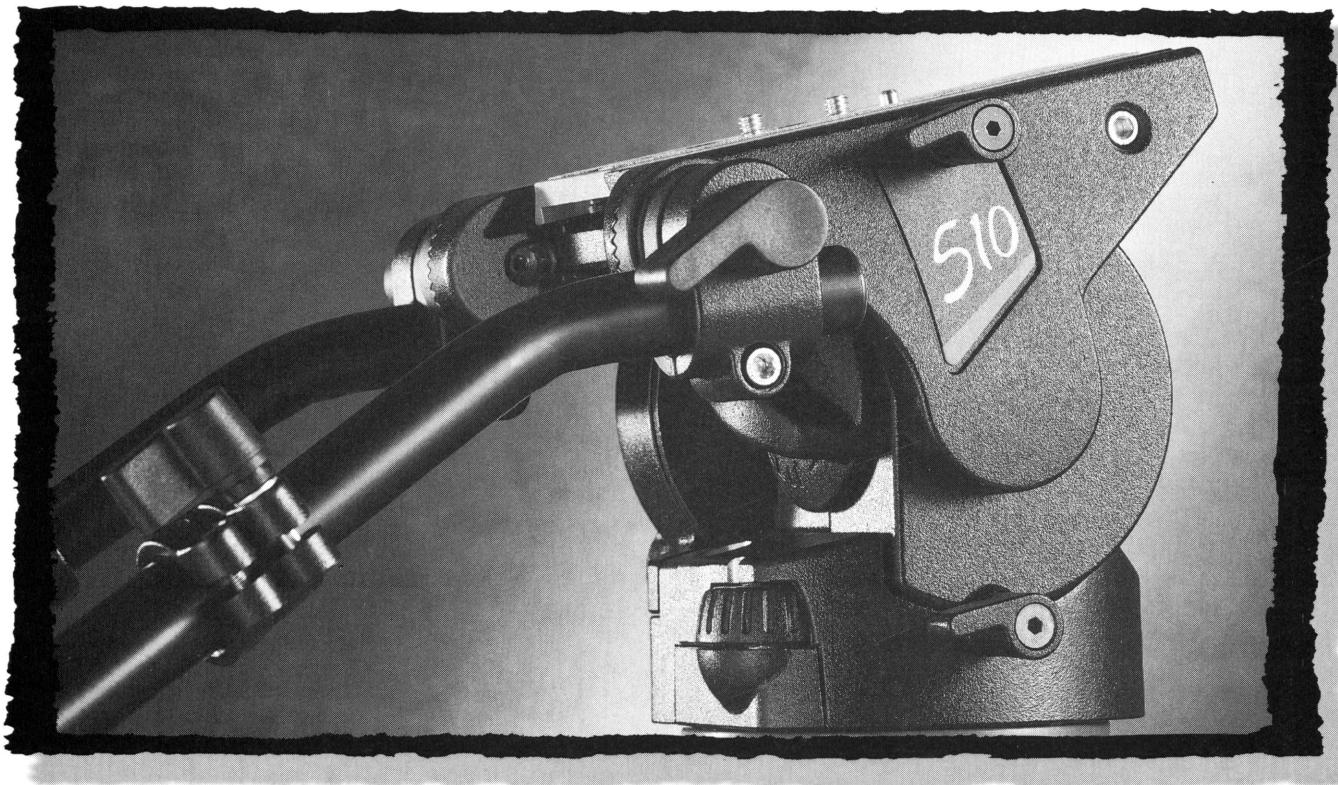
If the registry allows objects and classes to be described with information about their characteristics — say a "monitor" type or a "tape deck" type — then a system has been created where the presence of an object or class can be queried when needed, and the client need not have any prior knowledge of the specific makeup of the network.

An example of where this is useful, Guzik said, is an application that wants to pipe the output of a tape deck to all the monitors in the studio. The client retrieves the object controlling the specific VCR it wants to play, asks the registry for all of the currently registered objects of type "monitor" and instructs the tape deck to output to those devices.

Though Guzik's description is greatly simplified, it gives a general idea of how a network distributed objects system could work in television production. A news studio in New York City could be networked to a news archive server in Atlanta. Commercials could reside on a server in New Jersey and the director could command the entire production from Los Angeles.

Fully operational working studios, as described in this column, are expected to be online in less than two years, Guzik said. ♦

Frank Beacham is a New York City-based writer and producer. Visit his web site at: <http://www.beacham.com>. Mail: 163 Amsterdam Ave. #361, New York, NY 10023. E-mail: frank@beacham.com



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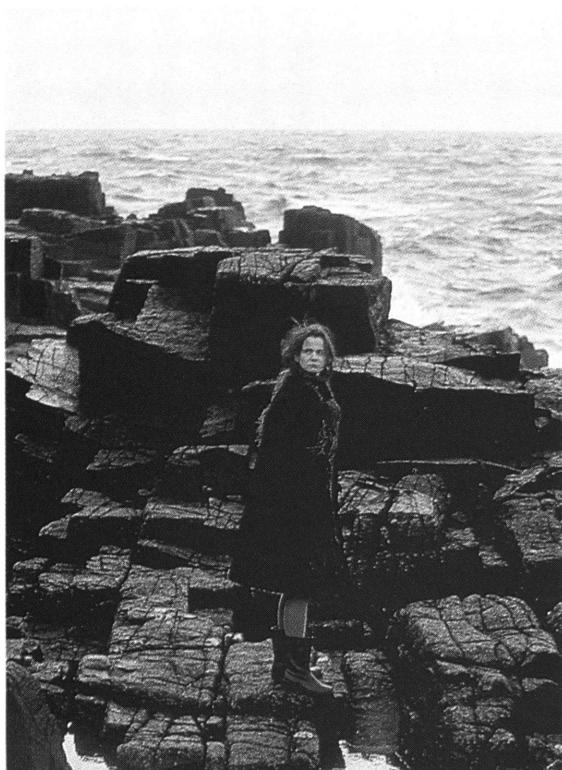


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Production Slate

compiled by Andrew O. Thompson



Above: Despite disapproval from her Calvinist community, the faithful yet naive Bess (Emily Watson) stands her ground on the rocky Scottish shoreline.
Upper right: Cinematographer Robby Müller, toting the handheld Moviecam Compact camera, plots out an interior scene with director Lars Von Trier.

Von Trier and Müller's Ascetic Aesthetic on *Breaking The Waves*

by Jean Oppenheimer and David E. Williams

Danish director Lars Von Trier (*Element of Crime*, *The Kingdom*) successfully sought to emphasize performance over visuals in *Breaking the Waves*, which earned the Grand Jury Prize at the 1996 Cannes Film Festival. Set in the early Seventies, the film revolves around Bess (English actress Emily Watson, in her film debut), a devout young woman raised in a strict Calvinist community. She marries a worldly oil rig worker (Swedish actor Stellan Skarsgård) who is paralyzed in an accident shortly after their wedding. Distraught that he can no longer have physical relations with his wife, Jan urges Bess to take lovers, telling her that his recovery depends on her doing so. Her



naïveté and faith in God convince her that if she heeds Jan's request, he will be miraculously cured.

To realize his austere, personal approach to this material, Von Trier entrusted cinematographer Robby Müller, BVK, NSC. "Lars wanted a candid look, as if the camera was a curious person that was looking all around, wherever they wanted to look," says the director of photography. "The actors didn't even know when they would be in a shot."

This was Müller's first collaboration with Von Trier. The cameraman is best known for his work with Wim Wenders (*The Goalie's Anxiety at the Penalty Kick*, *Alice in the Cities*, *The American Friend* and *Paris, Texas*) and Jim Jarmusch (*Down by Law*, *Mystery Train* and *Dead Man*). Müller's other major credits include *To Live and Die in L.A.*, *Barfly*, *Repo Man* and *Mad Dog and Glory*. A Dutch citizen, Müller was born on Curaçao, an island off the coast of Venezuela. He attended film school in Amsterdam in the early Sixties and became assistant to Dutch cinematographer Gerard VandenBerg. Müller says his greatest influence as a cameraman was Gianni Di Venanzo, who shot many of Federico Fellini's films. He notes "Di Venanzo's eye and techniques, [as well as] his know-how and talent, really touched me emotionally." His other key influences include Giuseppe Lanci and ASC members Conrad Hall, Gordon Willis, and the late Nestor Almendros.

Von Trier, who recently finished a grueling 15-week shoot for Danish television, declined to be interviewed

for this story, but as Müller describes, "Lars does stark, austere work, but it's not humorless. Everything is scripted; there is no improvisation, but Lars doesn't want much rehearsal. He often used the first take; after that, he felt the performances could become artificial. He is extremely efficient in what he says and writes."

Queried as to why he felt Von Trier considered him for *Breaking the Waves*, Müller candidly replies, "I don't know. We met briefly, but I rather quickly understood his approach to this film."

As the cinematographer notes, Von Trier's work on *The Kingdom* could be seen as the groundwork for *Waves*. He credits the director not only with designing the visual approach, but with determining what methods would be used to achieve it. To avoid "talking heads" and instill this character-driven film with a thoroughly cinematic feeling, Von Trier proposed a wide-screen format combined with "total freedom of movement for the camera," says Müller. "Together with close-in, handheld camerawork and no efforts to make to make things beautiful — nothing artsy or [high on] production values — he would draw you into the story in an honest way. And he never made compromises — even, for instance, when a whole scene was filmed out of focus due to a remote control that was decalibrated during a previous shot."

Since Von Trier wanted to protect the spontaneity of the performances, the sequence was not repeated. "Lars said, 'I have it,' Müller reports, "because he was exclusively going for the performances. And this rough imagery works because what he's giving you is the 'moment,' the best performance with no distractions. The style of the cinematography is not arbitrary or something that could be pulled out of a drawer. It was instead the consequence of making the film in the way Lars wanted to do it."

To capture this extreme neorealist vision, Müller relied on the Moviecam Compact, since weight was a

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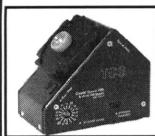
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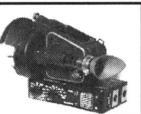


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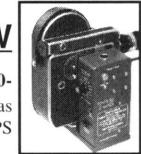
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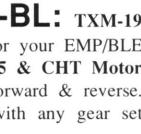
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key consideration for the extensive handheld work. He explains, "The Moviecam is good for a short while, but its gravity point is too far forward, so you have to support it all the time with your arms. To correct for that, [camera operator] Jean-Paul Meurisse, who is a very strong guy, put two big diver's weights on the back of the magazine as a counterweight. The whole unit tipped the scales at 55 pounds."

The extent of handheld work on *Breaking the Waves* demanded that depth of field be a key consideration. Therefore, Müller opted to use the Super 35 process to achieve Von Trier's chosen 2.35:1 frame — allowing him to use Zeiss spherical lenses instead of anamorphics. While a secondary consideration, this practice also reduced the Moviecam's possible weight.

Half of *Breaking the Waves* was filmed in Scotland, where gusting winds whipped across the barren plains with such ferocity that during exterior setups, two men had to hold Meurisse steady against the onslaught. Von Trier chose the Scottish locations, including a few scenes to be shot on the Isle of Skye, not only due to the financial assistance provided by the nation's film commission, but because the region's bleak landscapes, fluctuating weather patterns and constantly changing light were exactly what the story required.

In Holland, most cinematographers also function as operators. Müller would have liked to have assumed both duties on *Breaking the Waves*, but the lighting demands made it impossible. Explains Müller, "In one hand I had an exposure meter, and with the other hand I was changing the stop/aperture. In Scotland, the overcast skies are never really an indication of how bright it is. The type of light never changes, but the intensity does. I would look up at the clouds and try to determine what the wind would do and guess, all the time being careful not to come into the shot."

The film's interiors were shot on a stage in Copenhagen. But whether filming inside or out, the camera never stopped moving. The French-born Meurisse, who worked with Von Trier on *Zentropa* (released outside the United States as *Europa*), would swing the camera from actor to actor, sometimes catching just a fraction of a face against a wide expanse of sky or a glimmer of an

arm against a large chunk of wall, ceiling or floor.

Considering the operating challenge poised by Von Trier's needs, Müller adds, "Lars wanted to have this CinemaScope feeling because it adds an extra dimension to people when you are so close to them — studying them in the center of your frame, as you would when you are really talking to them. But Lars wanted to get rid of the compositions you usually see [in widescreen movies]. There was to be no extra stuff — only the actors. And that was very exciting because it forced us to rediscover looking at things innocently."

Müller also contributed to this plan by "not beautifying the light beyond the believable," further restricting the audience's eye to the performances.

The need to shoot in any direction at any time — what Müller's long-time focus puller Pim Tijerman refers to as "random shooting" — meant that there was no possibility of hiding any lighting fixtures. Outdoor sequences were shot under natural conditions; for interiors, the cinematographer employed practical fixtures — primarily table lamps as well as overhead Kino Flo fluorescents in the hospital scenes. Says Tijerman, "Sometimes we also had a little fluorescent tube or a little point light in the eyes as fill, but that was it."

While Müller used Kodak 5293 for day exteriors, 5298 was employed during nighttime scenes, poor weather conditions and all interiors. For these sequences, the 98 was pushed two stops, effectively rating it at 2000 ASA and alleviating the need for studio-style illumination. At that speed, Müller reports that even a 100-watt bulb in a table lamp sometimes registered too strong.

The cameraman conducted tests to see how far he could overexpose and underexpose, but he says that the 2000 ASA figure was never in doubt. "The 2000 ASA was decided upon, and I made tests only to see how big my latitude would be." Due to the high speed, almost everything could be shot at f2.1.

Force-developing the 98 did make the images substantially grainier, but this was an effect Von Trier accepted as a result of his chosen storytelling technique. This texture was made consistent throughout the picture by later transferring the entire film to video and electronically draining the color and en-

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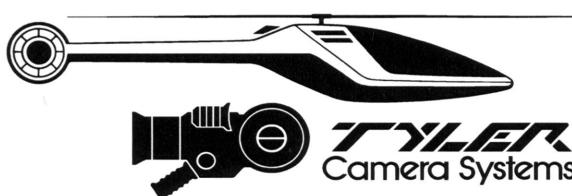
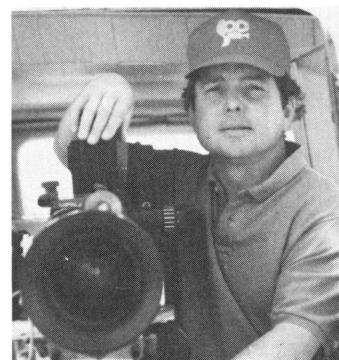


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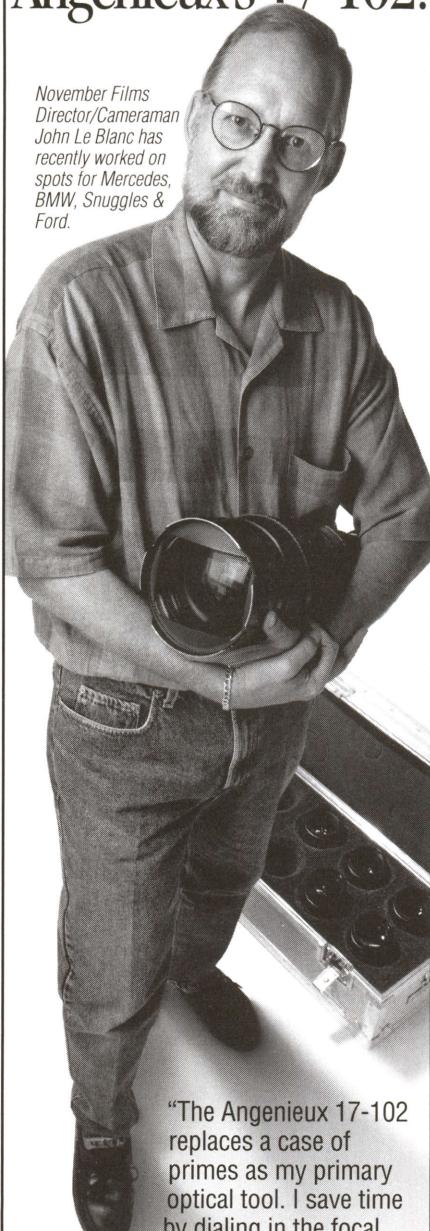
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hancing the grain where necessary — particularly in properly exposed exteriors shot with normally rated 5293 — before outputting it back to film. Müller concludes, "With this kind of movement and grain, and with the way we have pulled the colors out, you are left with nothing else but the performances, so you are immediately drawn into the story."

"The look of this film is the direct consequence of how Lars wanted to tell the story. No director of photography can propose such an off-the-wall plan without the director being totally in tune with it, and in this case, Lars already had it all laid out."

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After the profitable debut of *This is Cinerama* came the travelogues *Cinerama Holiday* (1955), *Seven Wonders of the World* (1956), *Search for Paradise* (1957) and *South Sea Adven-*



How the Midwest Has Won Cinerama by Andrew O. Thompson

Remember the days of yesterday, when a motion picture's grandeur lay more in its scope than its budget? Veteran projectionist/historian John Harvey recalls them vividly, thanks to Cinerama, the spectacular widescreen system devised by Thirties' inventor Fred Waller (its seven-track stereophonic sound system was perfected by Hazard Reeves). An Ohio native, Harvey first experienced the format as a teenager in 1953 at Cincinnati's Capitol Theater. After radio commentator Lowell Thomas introduced the demonstration film *This is Cinerama*, Harvey and his fellow spectators were thrust into a careening roller coaster ride at New York City's erswhile Rockaway's Playland and a dizzying flight over the Grand Canyon.

A 35mm process intended to lure television viewers back into the theaters, Cinerama requires a three-camera assembly: the center camera shoots the forward view, and the two side cameras capture the peripheral perspectives. The resulting composite image, which can produce an aspect ratio from 2.6 to 2.8:1, boasts an image area six times that of a



Top: A Technicolor frame from MGM's How the West Was Won. The second, and final, feature shot in three-camera Cinerama, this Western was the highest-grossing domestic film of 1962. Bottom: Art-house cinema The New Neon Movies in Dayton, Ohio, current home to Cinerama in North America.

ture (1958). Only two features were shot in three-camera Cinerama: *The Wonderful World of the Brothers Grimm* (1962) and *How the West Was Won* (1962) — the latter directed by John Ford, George Marshall and Henry Hathaway, and photographed by ASC luminaries Williams H. Daniels, Milton Krasner, Charles Lang Jr. and Joseph La Shelle — before the single-lens 65mm UltraPanavision format was brought in to shoot such screenbound Cinerama films as *It's a Mad, Mad, Mad, Mad World* and *Ice Station Zebra*. ➤

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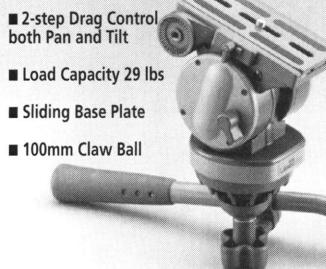
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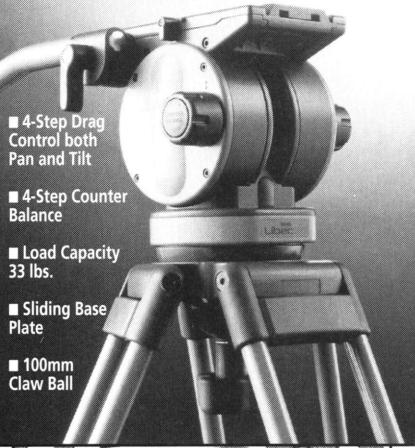
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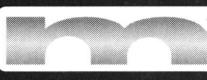
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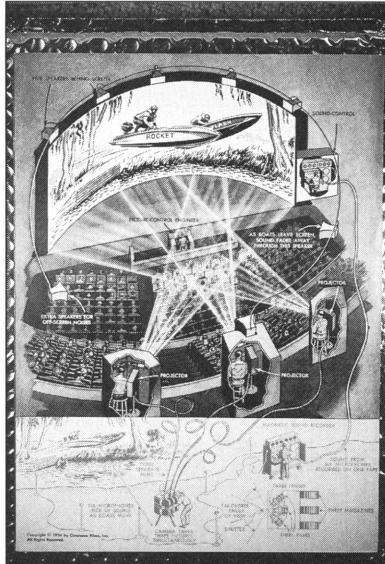
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A promotional schematic of the three-camera Cinerama system as it's being projected (in an aspect ratio of 2.8:1) upon a three-panel curved screen at an angle of 146 degrees. Thirties' inventor Fred Waller derived Cinerama's peripheral perspective from his designs for an anti-aircraft gunner training system.

day films on a radical curve yet yield good focus without distortion." Harvey eventually developed the "Wonderama" lens; it converts 35mm anamorphic prints for single-projector Cinerama use by not compensating for the difference in image distance from the center of the screen to its outermost regions during projection.

To present features in the format's full tri-image glory, Harvey erected a full-size Cinerama apparatus on his home's main floor in 1988. To do so, Harvey had to eliminate two bedrooms, most of the kitchen and part of the living room. To elevate the ceiling by three feet, he also had to gut the attic. Harvey refurbished his three-projector system with a unit located in a derelict Kentucky theater. Pieces of the A- and C-projectors are from Europe; most of the B-projector comes from a unit in Indianapolis, Indiana; and the seven-track sound reproducer is from St. Louis. Missing components were fabricated from scratch, based on original blueprints donated by Fred Waller's widow.

Persistent, Harvey accumulated Cinerama films in piecemeal fashion. For his initial living room theater, Harvey had assembled "rough condition" prints with missing scenes; he continually upgraded his prints with reels contributed from individuals in Australia, Germany, France, Italy, Scotland and all across the United States.

Harvey was pivotal in the installation of Cinerama at The New Neon Movies in Dayton, Ohio where weekly screenings of *This is Cinerama* and *How the West Was Won* have run since the Labor Day weekend.

In 1963, Harvey got his first hands-on experience in authentic Cinerama as a projectionist for Dayton's now-defunct Dabel Theater, where the complex process was used for almost a year — long enough for the youth to savor away a six-minute preview reel of *How the West Was Won*.

Harvey's fascination with the format continued, and, in 1982, he constructed a makeshift Cinerama system in the basement of his single-story suburban ranch home. He first modified three 35mm Century projectors and then built a 16' wide, 7' high screen. Ostensibly, Harvey created this mini-Cinerama to test out a theory for "a patented process that would allow me to show present-

One enthralled viewer, Wright State University film student Larry Smith, began organizing field trips to the projectionist's home theater. The student also continually badgered Harvey to somehow bring Cinerama to the greater moviegoing public. But Smith says that the reluctant projectionist "was always nervous about Ted Turner [owner of the MGM library] asking, 'What are you doing with a print of *How the West Was Won*?'" — even though he never sold tickets and never asked anyone for a dollar for all his trouble."

Fast forward to January 1996 when Smith, now manager of The New Neon Movies, received word that due to slow ticket sales, he was going to lose

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his autonomy in the theater's programming; a scheme was also afoot to slice the New Neon's one screen in half to draw in more patrons. Smith saw this as an opportunity to reintroduce Cinerama. The building's landlord, however, needed assurances that people would patronize a format that hasn't been publicly exhibited in North America for over 32 years. If Smith could get 1,000 guaranteed viewers by July 31, his proposal would be given the go-ahead.

On Memorial Day weekend at the annual Cinevent convention in nearby Columbus, Smith announced his and Harvey's intentions (later spread via the Internet). As of November 1, Smith had received some 2,000 letters of support (and ticket requests) from 36 states and five countries; the correspondence is now plastered on the walls of the New Neon's lobby, organized by state.

The plan was finalized with the landlord and Turner Pictures consented to a hands-off policy in exchange for a percentage of the ticket sales.

Over the course of 3 1/2 weeks, Harvey, Smith and group of 40 volunteers overhauled the cinema and transported the Cinerama system, piece by piece, from Harvey's home to the New Neon. The room required by the three sound-proof projection booths and the six-foot-tall, seven-track 35mm magnetic soundtrack reader meant that 88 of the theater's 300 seats had to be uprooted.

One-third of the theater's ceiling was then replaced by an iron curtain track bolted to the roof and the side walls. Approximately 980 3/4-inch wide dimpled ribbons were stripped together to form the lenticular screen; they keep the screen bent at a [continuous] seven-degree angle so that the light is aimed primarily at the center of the audience. Remarks Smith, "The screen is so deeply curved that if it's not sliced up by these narrow ribbons, the cross-reflection of light would wash out both sides right at the ends of the screen. With the amount of light that's being flooded onto the screen [4,800W], that was the only way to prevent washouts."

With the equipment set in place, Harvey hauled his 34-year-old print of *How the West Was Won* and his 44-year-old print of *This is Cinerama* to the New Neon. Harvey alone operates the Cinerama apparatus at each screening, and while rewinding the films he

inspects every inch of them for breaks or tears. (Harvey has modified the process so it can be operated by one projectionist instead of the five traditionally needed.)

Notes Smith on the *How the West Was Won* print, "If you look at the [reels], you'll see a half-inch that's kind of orange, maybe three-quarters of inch that's blue, and a couple of gray and brown areas. They're multi-colored because they're hybrids made up of over 20 different prints, but all of the material is IB Technicolor stock, which means it hasn't faded."

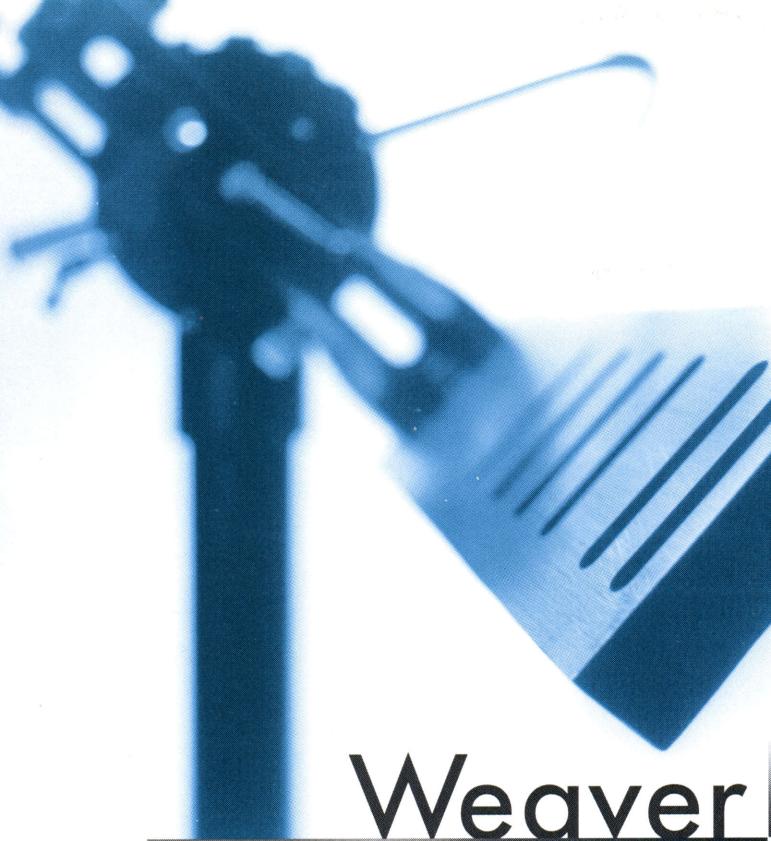
New soundtracks were also recorded for each film with the assistance of Tecon Industries' Jack Dimmers, who designed new sound heads from original Cinerama specs, and Michael Forman of Cinerama Incorporated, owner of the original soundtracks.

The New Neon's Cinerama double-bill has attracted numerous preservationists and historians, as well as film buffs from Sweden, Scotland, Italy, England, Germany and Russia. Last month, Smith added a Wednesday evening screening of the acclaimed Western to the schedule, as well as a monthly showing of *Cinerama Holiday* even though Harvey's print has faded to pink.

The Cinerama programming will run until May 31. Through use of Harvey's Wonderama lens, Smith is presenting the 1996 70mm restoration of Stanley Kubrick's *2001: A Space Odyssey* this month. On deck are the renewed 70mm print of *Vertigo*, and the retouched 20th anniversary version of *Star Wars*. Smith's grand plan is to roll out other 70mm classics, such as *Spartacus*, *My Fair Lady* and *Lawrence of Arabia*.

Whatever the outcome of Smith and Harvey's venture, the pair pride themselves on having proved Cinerama a worthy competitor to modern widescreen formats. Says Smith, "Even if Imax and Omnimax have larger — but technically not clearer — images, they can't match what Cinerama does, in that its field is limited to what the human eye can process clearly at the same time. Look at the virtual reality being offered to the public right now. The shape of a VR screen when you put the helmet on is that of a Cinerama-shaped curved screen. Cinerama is a mass VR experience."

The New Neon Movies, (937) 222-8452, Fax (937) 222-4119. ♦



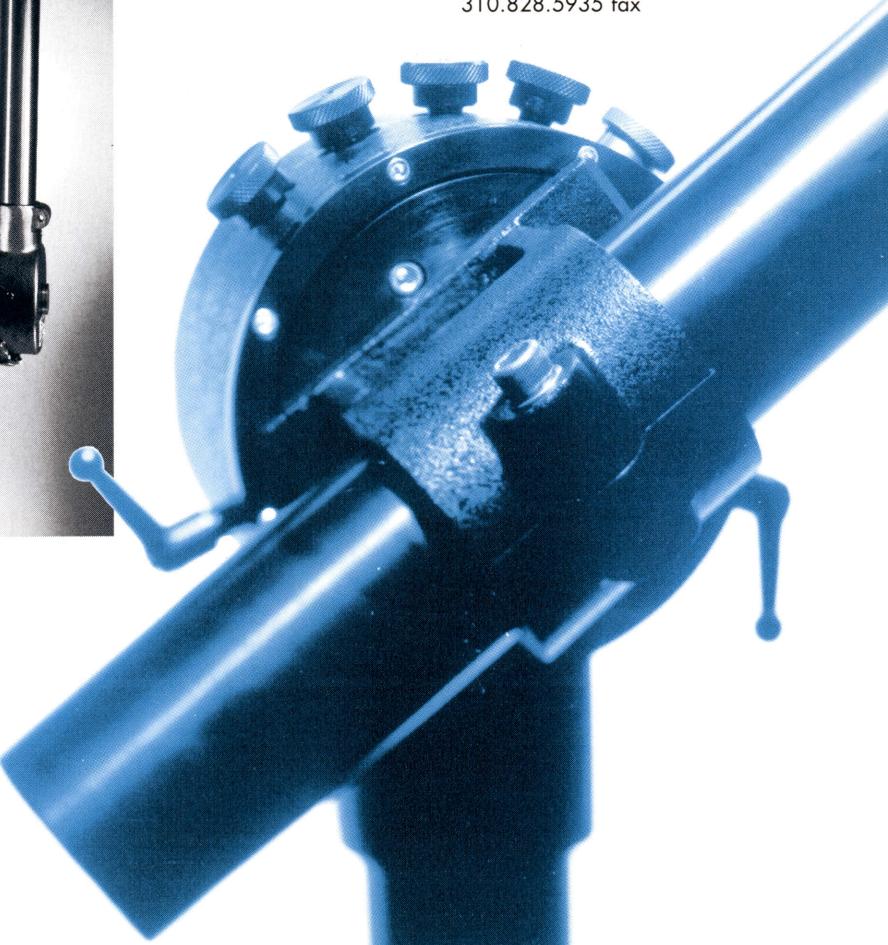
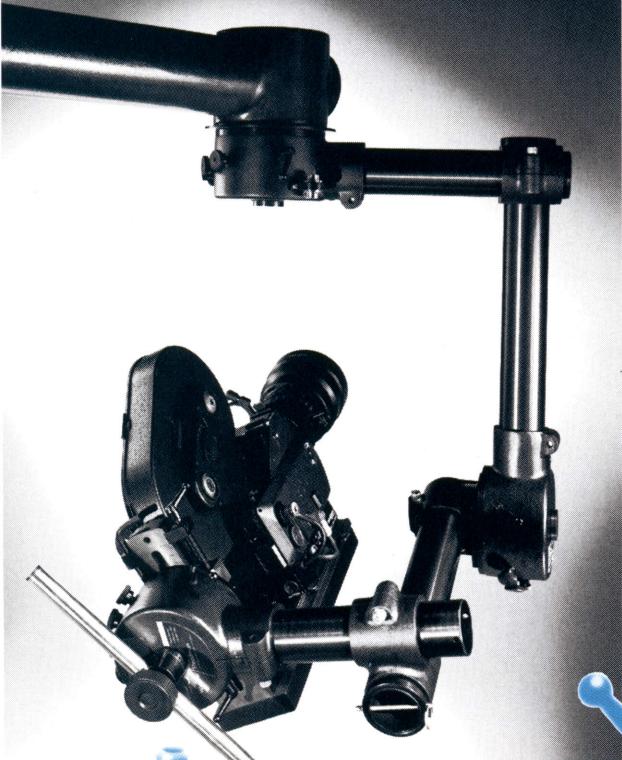
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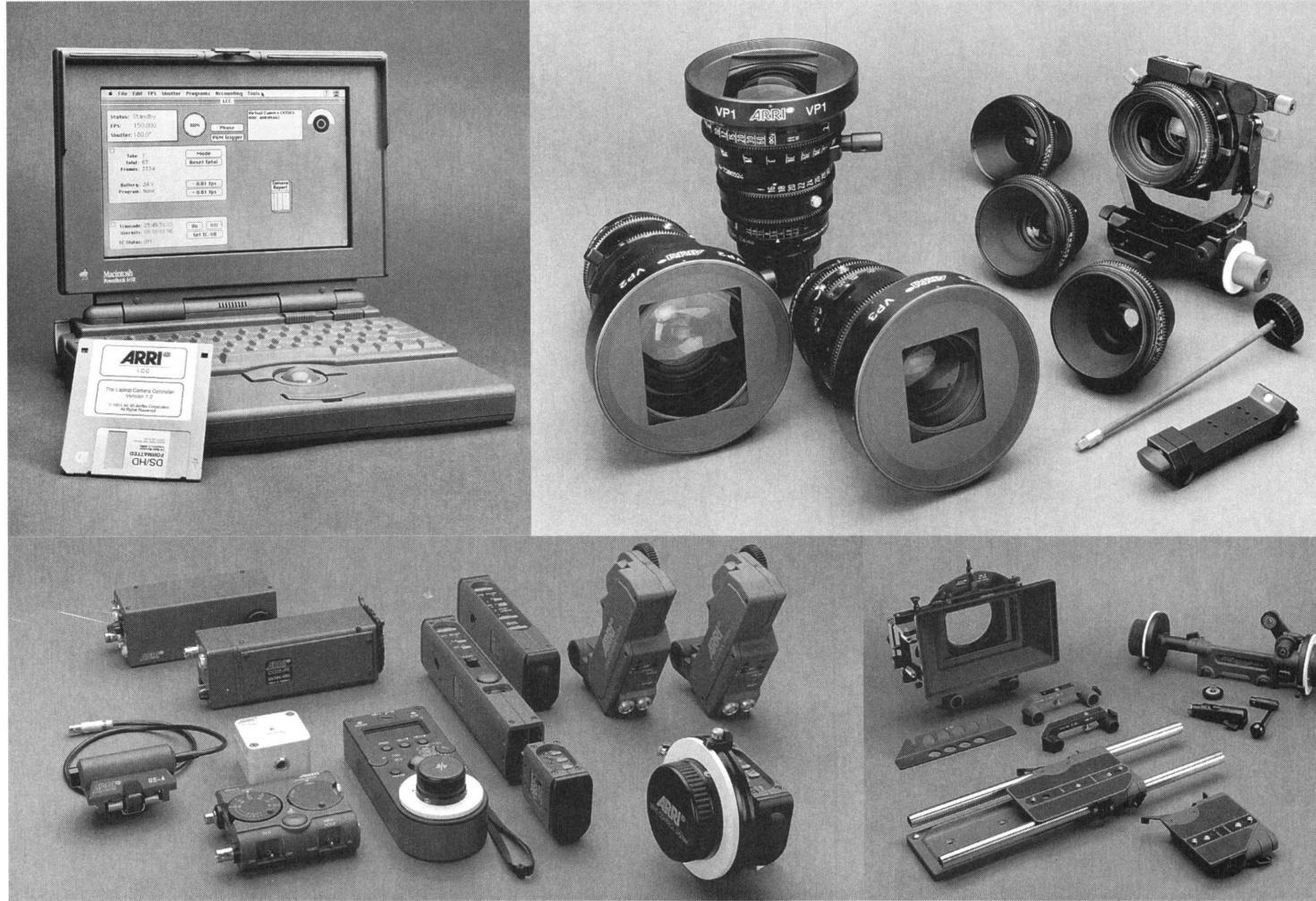
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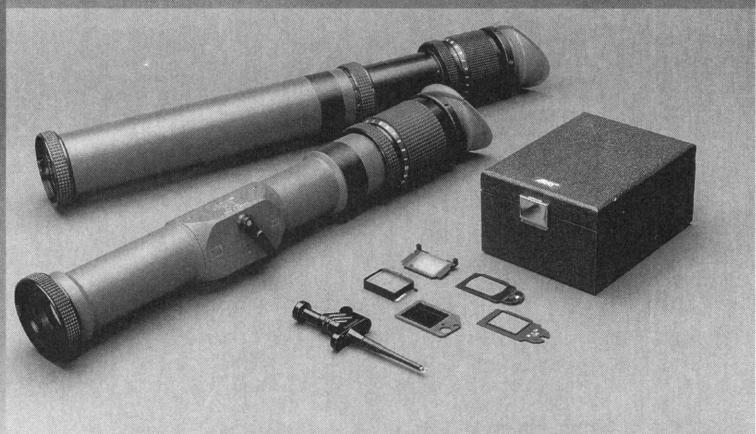
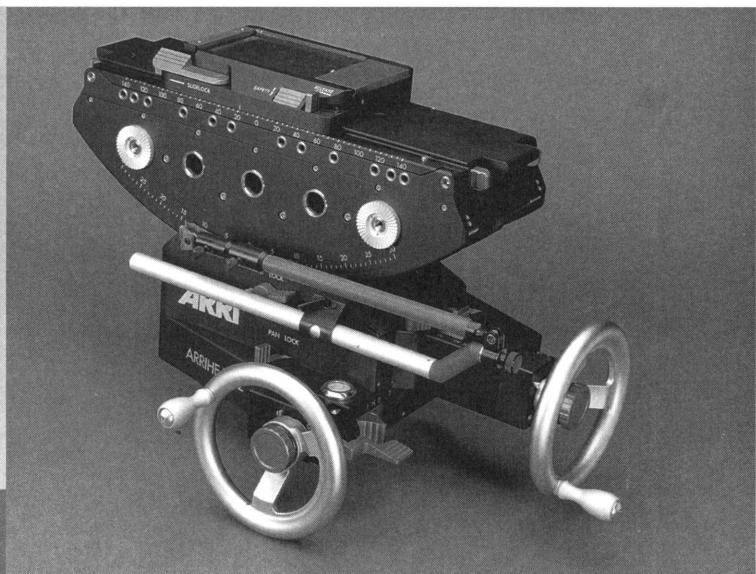
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*In 1962, Nazi SS Obersturmführer Adolph Eichmann was found hiding in Argentina. Peter Malkin of the Mossad was assigned the task of bringing him back to Israel. The tale has been retold in Turner Network Television's *The Man Who Captured Eichmann*, starring Arliss Howard as Malkin and Robert Duvall as Eichmann. In the following excerpts from his location diary written in January and February of this year, cinematographer Robert Steadman, ASC reveals the production's logistical and artistic challenges.*

♦ We have arrived in Buenos Aires at last. At fourteen and a half hours, this was one long trip. The hotel sent a nice young lady out to the airport to collect my gaffer, Alan Goldenhar, and me, and she had us whisked through customs with no problems. We saw our director, Billy Graham, and Bobby Duvall in the lobby when we arrived, and headed out for dinner immediately — at Dora's, that Old World temple of gastronomy that was to become our indulgence. Steaks, potatoes, and calamaretti, with good red wine and flan swimming next to a huge blob of *dulce de leche*. Health food hasn't made many inroads here.

Alan and I met Billy at breakfast the next morning, then proceeded to check out some locations on the way to the office. Billy, decked out in the full regalia of an urban warrior/filmmaker, is a sort of aging Boy Scout who's prepared for anything. His ensemble consisted of shorts, a New York Yacht Club shirt and ball cap with "Surf Dog" embroidered on the front. Strung around his neck was a Minolta with a long lens and a Leica with a 21mm; on his back he wore a rather heavy backpack with who knows what inside. A water bottle hung on one hip, and the other sported the ultimate in urban navigation, a GPS receiver. "You see, you just set the waypoints of the locations you like in here, and oh, here are the hotel coordinates," he enthused. "I know you think I am eccentric, but we'll never get lost!" He is such a character.

We met the office staff today, then did a round of meetings and a preliminary location scout.

I suggested that we build the "prisoner's bedroom" on a stage, as we have about five days of shooting there. This was met with guarded enthusiasm. I hope they will go for it, because everyone will be much more comfortable. The

the bank notes he had gotten from the driver hadn't been in circulation for some years, and were worthless. Too bad, but he was incredibly good natured about being taken so badly. (Pesos are pegged to the dollar, one to one.)

Argentine Diary

Cinematographer Robert Steadman, ASC recounts his experiences shooting TNT's *The Man Who Captured Eichmann* on location in Argentina.

production designer is drawing up some plans now.

♦ Pretty much the whole company blithely walked out into the world this morning with nothing more on our backs than light shirts, figuring that the gods who protect filmmakers from the vicissitudes of weather would be with us today. Wrong. By the end of the day we were dirty, muddy, soggy soldiers. All of us except one: the Boy Scout. Billy was snug and dry in his yellow slicker.

Our Scout led us to a breathtaking apartment, probably built early in this century. At least 3,500 square feet in size, it was filled with old books and antiques. It was so elegant, like something from Madrid or Paris. This is truly a European city. At the opposite end of the spectrum, we saw the house where Eichmann had lived. Almost a hovel, it was set next to a fetid canal that stunk of raw sewage and industrial pollution.

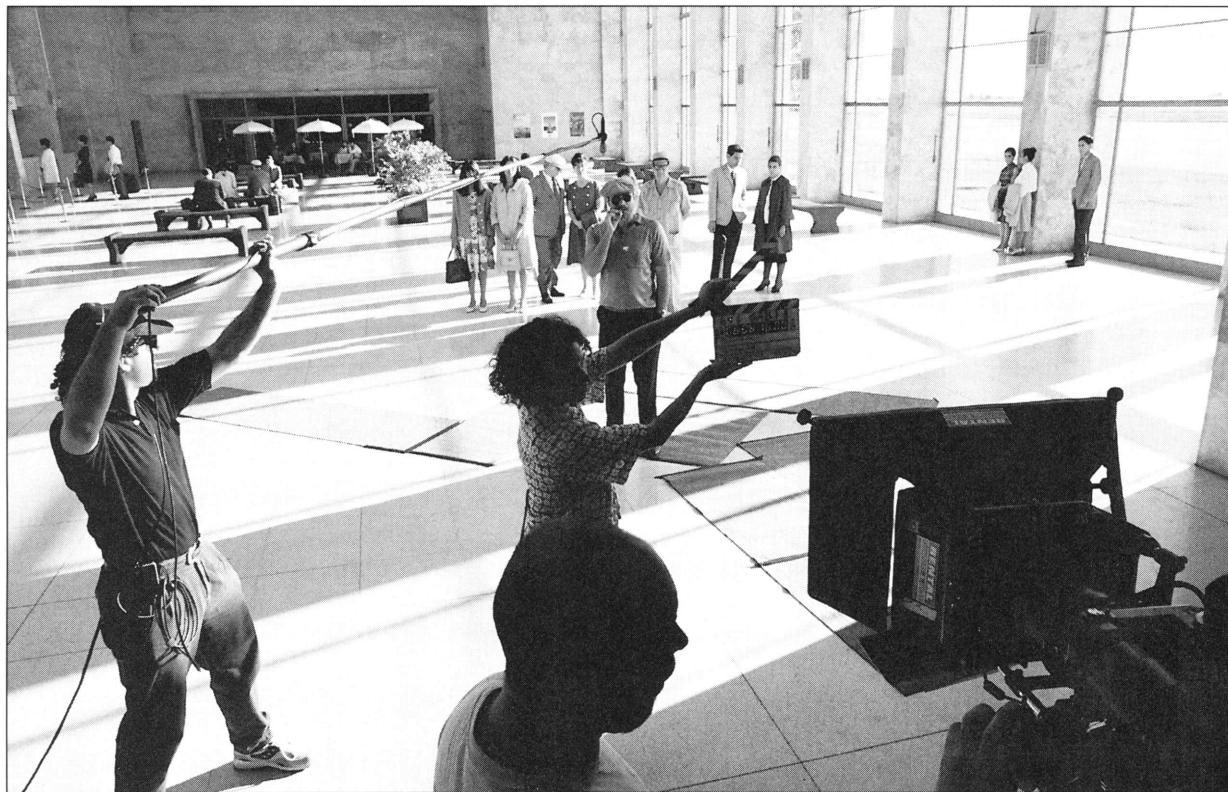
Alan and I grabbed a cab for dinner tonight down by the river. Old warehouses down there have been refurbished into smart shops and restaurants. The cab driver was a classic hustler, who wanted to steer us to his restaurants, asked us about our taste in señoritas, etc. When we got out, he wanted to change his 50 peso notes for Alan's 100 peso notes. Alan obliged, and we were rid of him. The steaks were great, and the decor *tres chic*. When it was time to pay the bill, Alan discovered that

♦ They are going to go for the prisoner's bedroom on stage. The cost of the set was only about \$5,000, and who knows, it may save them 10 times that if we cut a day out of the schedule.

I am going to have to watch my waistline around here. It is not just the Argentine beef, it is all the stuff that goes with it. The wine, beef, empanadas and flan *con leche dulce* are so good that it is pretty hard to say no. Heard something amusing at dinner last night: "The Argentinean is really an Italian who speaks Spanish and thinks he is an Englishman."

♦ Alan and I went over to the rental house, Cameras Y Luces, and shot some camera tests. I did a steady test, shot a chart with all of the lenses, and then went through both 5248 and 5296 with progressive over- and underexposures. I was welcomed not only as the cinematographer of the show, but as the inventor of the Weaver/Steadman Head. That was very nice; I felt like a bit of a celebrity. They told me that a commercial company was in there recently and had one, which they liked very much. I gave them a demo of the head, and they said that they wanted to buy one, as they got a lot of requests for them. I'll put Weaver in touch with them.

♦ Billy, Fernando (the first A.D.) and I went out to scout for night locations last night. We found a really cool location for the "road-block" scene. It has cobblestone streets, ominously heavy trees on



The crew sets up a shot of the Mossad's arrival at an airport terminal in Buenos Aires. This terminal, now abandoned, was the actual historical site of the events re-created in the film.

both sides of the street, and Spanish colonial buildings on both sides. We had been down this street a dozen times during the daytime, but not until night did we see the possibilities.

We had dinner last night at a German restaurant that Eichmann used to frequent. The restaurant had a lovely beer garden, and an ancient bowling alley! There were four decrepit alleys, with a pin boy, and wooden bowling balls. It has been a long time since there was significant German immigration into Argentina, and I think the food here suffered as a result. As I washed up in the men's room, it occurred to me that the tap that I was turning had had Eichmann's hand on it.

Today we shot a makeup test with Bobby Duvall, who is very nice. He looks very much like Eichmann, and is pursuing all of the old Germans around town for research.

♦ We had a budget meeting yesterday, trying to cut down on the days that we use the camera car and Condors for lighting. Both are really expensive, and we are on a fairly limited budget. One of the problems that we have had to solve is that of shooting both Eichmann's

and his sons' cars going to the airport for the climax of the movie. This takes place at night, and my plan was to bring in a 300mm f2 lens and shoot with available light. Well, after scouting the streets at night, I found that they were just not that bright. Also, through the lab tests that I did, I found that the 5296 that we are shooting isn't too great at an ASA of 500, either. It is more like an ASA of 320. So, while an f2 lens would have worked, the quality would have been disappointing. (We are shooting this relatively outmoded film stock instead of 5287 because we are saving something like \$15,000.)

My solution was to surround our picture cars with a phalanx of period cars and shoot car-to-car. Not only would I get to use a faster lens, but we would get longer pieces of film at a time. The only problem was that even though we had saved the expense of importing the fast 300mm, we had added more time with the camera car. We did some juggling with the schedule, and found a more efficient way to group the camera-car material together. This left one excess day, with daytime car-to-car. I suggested that we rent a convert-

ible and use that as a camera car, shooting in traffic handheld. Then in jest, I suggested that we trade Billy's car in and give him the convertible. That way we wouldn't be spending any extra money. This was met with great enthusiasm, but so far they haven't been able to find a convertible.

Our first day of shooting was at an outdoor cafe in the "Recoleta" district. Recoleta is a fashionable residential area that has upscale apartments, antique shops, cafes and lots of beautiful people. In the scene, a blind man is introduced to Eichmann, and recognizes his voice and cologne. It was an easy scene to start with, but we were hampered by airplanes all day, and the fact that the actor's knowledge of English was pretty much limited to the 132 words of his part, which he had memorized flawlessly. Still, we finished on time, and it was considered a pretty good first day.

The second day involved shooting a scene in which Arliss Howard (who plays the chief Mossad agent) visits his mother for Shabot. She reminisces about her dead family members, "61 of them, all gone up the chimney, and the

Right: An artificially created rainstorm lends ambience to the moments leading up to Eichmann's capture. Below: Members of the production team listen as actor Arliss Howard (far right) offers a suggestion to director Billy Graham (far left).



world stood by." Rita Zohar is a great actress, and it was especially poignant, as she had actually been born in one of the camps. We made a company move and still wrapped by 5:30. If this continues, it will be a pretty easy schedule.

♦ Fernando, our 1st A.D., got ripped off today. It was right in front of the hotel while loading up for work. One of the P.A.'s put his bag in the trunk of the car, and while nobody was looking, the thief took his bag, which contained his \$4,000 Powerbook, \$800 in cash, etc., etc. It was an unbelievably professional job.

We saw dailies the other day on a television set that had a fatal "loss of chroma" attack. It literally died before our eyes while we were watching the first day's dailies. Greens became a rich shade of vermillion that washed through the low lights, and the highlights were a sort of feeble pink. This was not cool. I knew it was coming, too, because a warning flag went up in my head when I heard that the $\frac{3}{4}$ " machine was coming into the office. I was out at the lab, and never did a follow-up quality check. So that was kind of disappointing, but we have it worked out — sort of. We still have the big old sick TV, but it does a better job on audio than the tiny 9" monitor that we are watching the picture on. It is a great picture, though. You just have to sit kind of close.

I had to laugh the other day about our camera gear (which is working pretty well). I am in the ASC, and I go to these meetings



where Denny Clairmont and Otto Nemenz show us all of these hot cameras, Moviecams and such, and here I've got a couple of old Arri BL clunkers! I wonder if I will ever get to have the state of the art again. They are working okay, though, after the BL-3 went into the shop for an emergency sound check. We tried to use it in a two-camera situation, but the sound department revolted. It was pretty bad. Anyway, the next day a tech from Cameras Y Luces came nervously to us for a sound test, and it was pronounced usable. There were many smiles, handshakes, and apologies, so the camera has worked out all right, but it is still a grinder.

The errant zoom motors from Cine-Video Tech in Miami finally made it to the party — so far so good. I have primes from 14 to 135mm, all Zeiss. Most are high-speed, so that is cool, and the zooms seem pretty good.

I have an apartment to shoot in tomorrow (we shot there today) that is absolutely gorgeous. It was probably built in the 1920s,

and is close to 3,000 square feet in size. But it is on the third very high floor, and I can't get any heavy stuff, such as Condors, in this small courtyard. Therefore, I have almost no control over the windows. I am dependent on natural light to get this. Tomorrow is a four-page scene in one room, so I had better drag out the BL-3 (the "old grinder") and shoot with two cameras.

♦ Well, it worked out pretty well. In the first place, the scene was staged down at one end of the room, so I really only had to worry about one large window source. I had access to the roof, which was two stories above, across a large

courtyard. At first, for a sunny day look, a 4K Par was enough to bounce off the floor from the roof. This was pretty convincing. However, for a soft light look I had to paper the window and hit it with two 12Ks, taken laboriously up

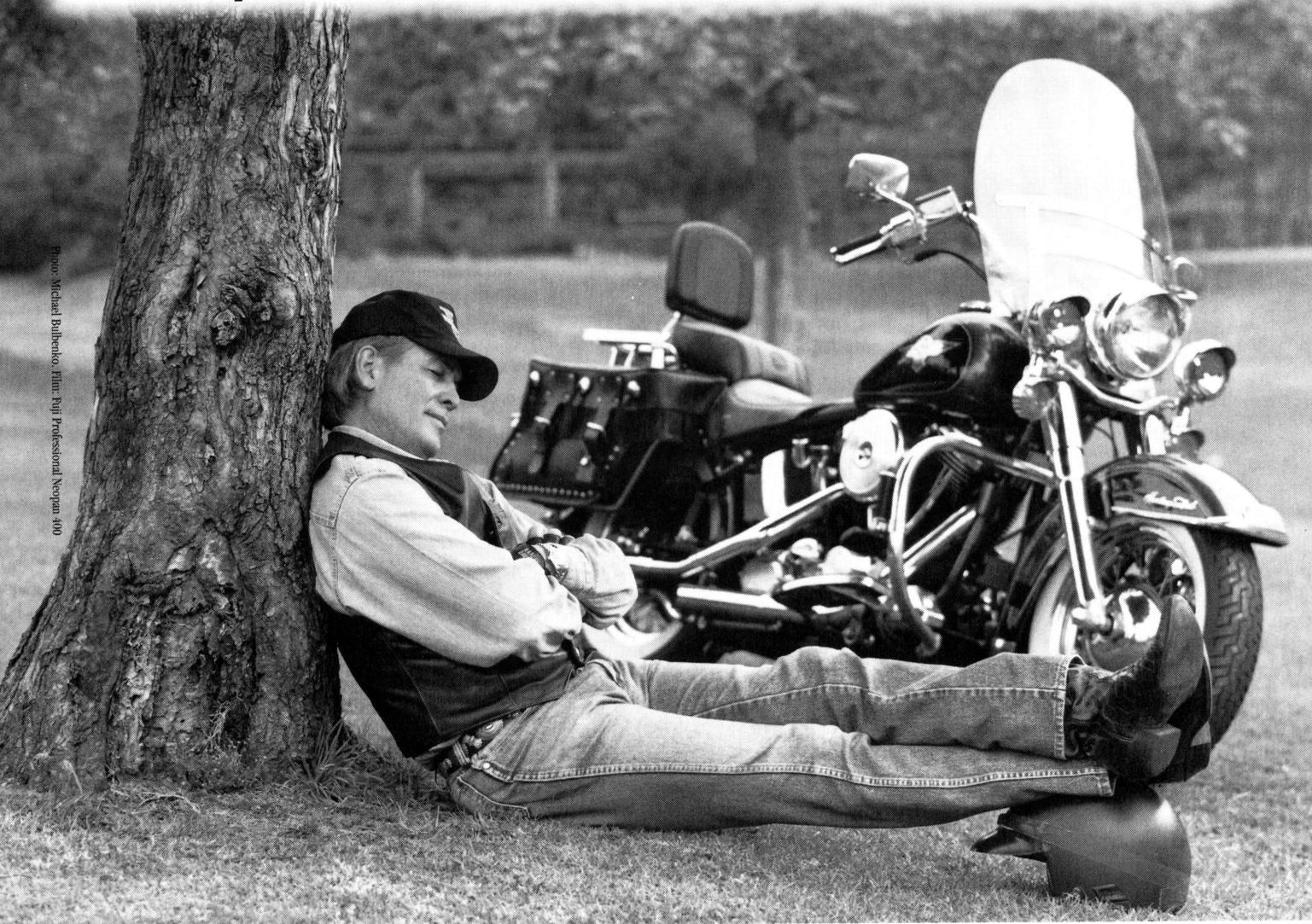
to the roof. A combination of natural light and the various HMIs that I was able to bring to bear from a distance did the trick.

♦ We did a street scene set in Tel Aviv. It was a long walk-and-talk, and the art department did a great job with signage, Arabs and Hassidim. We shot it with a 150-600mm zoom, and it was pretty convincing.

♦ Today was frustrating. Whenever you do a tow shot, you always seem to take longer to get started than usual. Everybody knows it, and everybody tries to make it better, but it is just slow. The actors were perhaps a little late, not much as it turns out, but we had a Nagra go down in the middle of the thing, and that was another pull-over-and-stop situation. I wasn't even trying to light from the windshield. All I had in there was a little fill from a couple of Kino Flo tubes. We are not on a trailer, because there is none to be had here, nor a truck to pull it. Thus, I can't rig light outside the windows, because it is too big a

On the open road, Steven Shaw can enjoy the moment.

Photo: Michael Bulleitko. Film: Fuji Professional Neopan 300



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deal. It should look pretty good anyway, but the backgrounds are hotter than I would like. Then we got into the airport and things went pretty slow. My part was fast, a few fluorescents for most of it. But it all seems to take more time than it should, even with the amount of extras and all. We have extra takes because of focus, and that is an area of concern I wish I didn't have. We didn't "make the day" because there was a move and another exterior to shoot. I am using the second camera quite a bit, and the camera crew is a bit overextended with magazines, slates, and all. They want more help, and they should have it. I will have to go to bat tomorrow on that one.

The electrical crew is learning the methods Alan and I use, and their boss, Jorge is first-rate. He speaks very little English, but somehow understands seemingly everything. Alan is having a ball with the language and his job. What a joy it is to have him. Speaking of joys, Guy "Bulldog" Skinner is a great operator, and he takes much of the drudgery out of my job. Our Argentine support is generally young and enthusiastic. What they lack in experience is pretty much made up for in charm and willingness to learn.

◆ Today we had a sequence to shoot in the rain. It involved our team practicing the capture of Eichmann out in a muddy field, and dragging him into an old Mercedes. We had the water truck ready, the manifolds were hooked up and there were a half a dozen "rain birds" standing by. However, Mother Nature did the trick for us. When we finally shot the scene, a stormfront blew through and it was raining the proverbial cats and dogs with wind and lightning to boot. It looked great, but it was a good thing we only had to do one shot, as the weather quickly got the best of us.

◆ Last night we did the first of three days at Garibaldi Street. Eichmann moved around every few years, and it was here that he lived when the Israelis got him. St. Fernando, as the area is called, is just one notch up from a shantytown. There are modest brick homes, and even some with

cars parked in front, but they share the neighborhood with tin shacks outfitted with cardboard and old lumber to keep the winter winds out. In the Sixties this must not have seemed to be part of Buenos Aires, but just another small agricultural town. Today it has a small river or creek running though it, stinking of pollution, both human and industrial, its banks cascading garbage into the greenish water.

This is a rough place. Fernando, our A.D., got hit in the back with a rock, lobbed from a great distance. The perpetrator escaped in the darkness. Of course, we were objects of intense curiosity, and the crowds of onlookers didn't abate seriously until well into the early hours of the morning. We had trains, were making rain, and had logistics to worry about. The set comprised an elevated rail bed with an overpass, the bus stop that Eichmann arrives at, and his house. All of this is in an area of several acres. We had two 60' Condors fitted with 4K and 12K HMIs, and I put some Molette streetlights up on conveniently placed telephone poles.

The scenario is this: the Israelis survey the house from the vantage of the elevated road. From this vantage point we can see the Eichmann house and the route that he takes from the bus stop. This is where they snatch him.

The real house is a block farther from the rail bed. You can't see it from there any more, as there is now a small warehouse blocking the view. (Billy's old Mercedes motor home is parked in front of the real house.) We took a closer house and built some setpieces to give us windows and doors where we wanted them.

Though our Eichmann house is closer to the railroad, it is still too far away to get a close shot of Eichmann at the window. The solution was to erect a parallel from which we could shoot at half the distance. However, this is supposed to be the point of view of the Mossad team as they watch from the underside of a passing train. We wanted to have the train wheels going by in the foreground. The solution was quite simple. We did the Eichmann shot clean, then went

back to the roadbed to shoot the foreground train wheels as they went by. I took a white Grifflyn and placed it on the opposite side of the tracks. After lighting it evenly, I shot it with a 50mm lens with the silhouetted train wheels going by in the foreground. This element is to be matted over the 300mm shot of Eichmann, giving the illusion that this is the Mossad's view from under the train.

One of the neighborhood kids told us that his father knew Eichmann, the old German. Of course, they thought he was just a bit crazy, but when they found out that he was a mass murderer they were all amazed.

◆ After three days of rain effects, mud, trains and night lighting, we have fallen a day behind. Three days have become four at Garibaldi Street. It is a climactic scene in the film, so Stan Margoulies is not going crazy about it, believing we have to get this part right.

We were getting ready to shoot a handheld shot of Eichmann being dragged to the waiting car. At the last moment, we discovered that the speed control that allows the camera to undercrank was not on the truck. I went berserk for a minute, and there were apologies from the miscreants. It was a communications screw-up, but we will recover tonight.

◆ It is midnight, and I am back in my warm, dry hotel room. Disaster has befallen our intrepid little band of filmmakers. The recovery was not to be. Once again, we were shooting a rain sequence and the real rain came in. This time it had disastrous results. We got four shots, and the wind and real rain added to ours, which looked terrific. But when the front came in it damn near drowned us. We did drown most of the electrical gear, including a flooded generator. This put us out of business for tomorrow, which becomes a down day. The poor electricians are still out there in the mud, winning back their cable and soggy ballasts. We will be back at Garibaldi Street on Monday night.

Billy has a bad case of bronchitis, and he feels lousy. He shouldn't be out all night tramping in the rain, so this three-day week-

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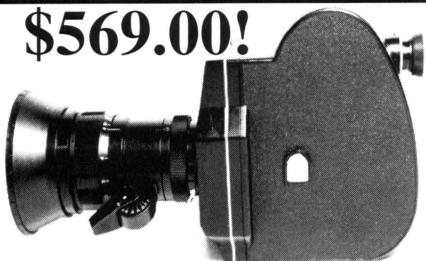


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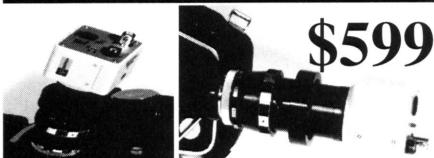
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end is just what he needs. The way it looks now, we are a day over. We can probably fix that, but it will take some doing.

◆ "Viento En Popa" is an Argie expression that translates into something like "easy sailing." Literally it means "winds on your stern" (popa=poop deck). Well, I hope that we have *viento en popa* from now on, because we have finally finished the last night at Garibaldi Street. We shot the capture itself, with Arliss Howard wrestling Duvall in the mud and rain, as lightning punctuated their movements.

A technique that Billy and I have been using for a lot of these violent scenes is one that we borrowed from the world of commercials. Shooting at eight frames per second, then transferring at the same speed, makes every frame last three times longer, with a jerky, blurred effect. The time base is the same — that is, it does not speed up the action, because the film is transferred at the same rate at which it was shot. Sound can still be synched to the action. It is an imprecise technique, because we never know just exactly what we are getting, but it can produce striking results. I tried to use the lightning effect to freeze frames that I thought effective. Thank God we are through with night, rain, and Garibaldi Street with its sticky mud and fetid canal.

◆ The pace of work has accelerated recently. Due to Argentine work rules and travel times, we are limited to a ten-hour workday instead of the 12 that we are used to at home. As a result, it has been difficult to get all of our work done on a given day. However, we are continually making adjustments, and we have the unit humming along pretty well now. One of the key ingredients has been to get people to anticipate our needs one or two shots ahead. This has made a big difference. We are still bedeviled by focus problems, as our assistants are young and most of their experience is in commercials, where focus requirements at close distances are minimal. Guy and I have been trying to get them to do more measuring rather than taking visual focus marks, so there

has been some improvement.

The art department is still a problem. Their leadership and overall design is good, but there is no effective on-set followup by props or set dressing. We have made some headway, but at times we throw up our hands in frustration. The Argentine system prevents people from being replaced, so I don't look for any great improvement here.

We have a little over two weeks to go, and I am getting tired at the end of the day. Six-day weeks are the bane of our existence, as they just do not allow a full recovery at the end of the week.

◆ Today we did the first of five days on the stage. It is wonderful to be in an air-conditioned space, with the ability to pull walls and not be on top of each other.

This stage stuff is terrific. We have two world-class actors, and they just do each take perfectly. They might find some nuances on the second take, but they are right-on the first time. Duvall's German accent and gestures are so good they are uncanny. The man is totally prepared, and can do literally any scene from the picture at any time. He had his part memorized before we started shooting. We shot about seven pages of dialogue today, and it was so dense on the page that it timed out to a whopping 13 minutes. This is not particularly good news as this is talky in the extreme, but I think that the material is compelling, and will more than carry its weight.

We did an extra two-page scene this evening without going into overtime. At this pace, we might just make up the lost day. I am keeping my fill levels quite low, and the key lights are strong crosses. It is quite a nice look. The shots are quite simple, as Billy and I didn't feel that a show of graceful camera moves are called for here.

There are two weeks to go, and I am already trying to put together another job. I had a request to go to Miami on a commercial, but the time might be too tight.

◆ This "prisoner's bedroom" sequence is really a big deal. It times out to about 40 minutes, which is most of Duvall's performance in the film. This is when we

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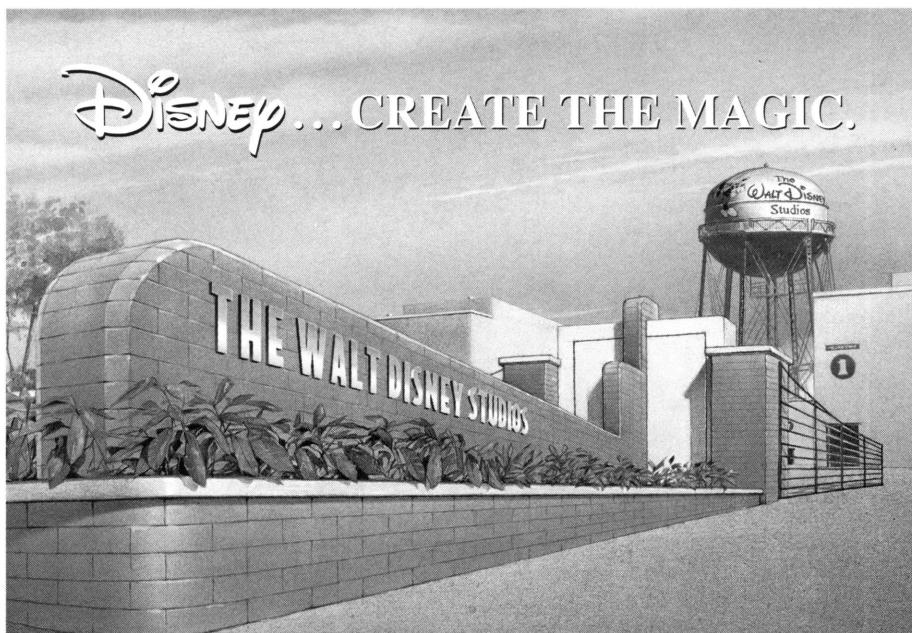
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hear his side of the story. The thrust of Eichmann's (Duvall's) dialogue is the old "vee vas joost followink orders." Obeying and enforcing the law was all the justification that Eichmann needed to kill the millions that he did. His mindset was that of a civil servant who felt that he had done a great job, despite horrendous odds. Arliss' character is mostly nonplussed, then devastated.

It is really hard to see if this scene is going to work. It is all shot in a very small room with no decoration of any kind on the walls. Most of it is at night, so that further complicates things. Anyway, I hope the look that I have chosen translates onto the home screens, and that it isn't so dark that they try to time it up and ruin the effect. Moreover, I hope that audiences are still interested at the end of the 40 minutes, and not on to some other channel.

♦ Duvall was frustrated on the last stage day, and I don't blame him. We were beset by a number of nagging technical problems that caused one delay after another. Bobby walked off, saying he would be back "when we had our shit together." Well, you could hear a pin drop for about five minutes, and he came back in, and we did the take. He didn't want to do another one, but Billy got two more out of him, plus a pick-up for the beginning. We kept this coverage very simple; as Billy said, "we were along for the ride." By that he meant that he wasn't going to have much control over the interpretation of the piece, as it was being carried by two fine actors. Our job was to create the best possible environment and record the performances of a couple of real pros as tastefully as possible.

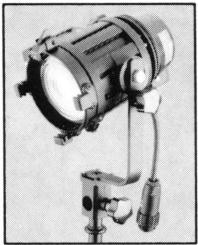
Duvall is a producer here, a player beyond just being an actor. The way he controls not only his performance but Arliss' as well is really cool. He has worked out hand signals with Rob Carliner, his assistant. If Bobby thinks that Arliss is opening the throttle prematurely, or whatever, he will let Rob know, who will tell Billy. If Billy agrees (or is at least curious) he will go to Arliss as if it is his idea. After some discussion, Arliss



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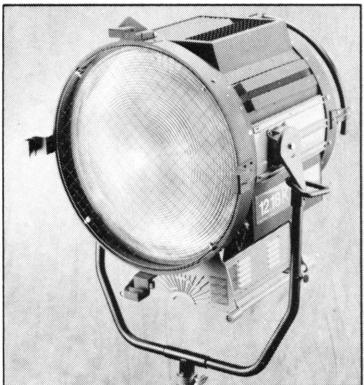
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will usually agree. This way, everybody gets what they want, and nobody's ego is stepped on.

♦ We are now shooting in the "Mossad screening room" at a large Air Force base. It is a reasonably large space with good ceilings, so I can't bitch. Most of the rest of the picture is shot here. Argentina's military is a largely discredited institution since the Malvinas (Falklands) War. The country ended its compulsory draft, so this base is now largely deserted. One can't help but think of the crimes that may have been committed there during their "Dirty War" (late '70s, early '80s) when thousands of Argentines disappeared because they were leftists, or intellectuals.

♦ The folks at Turner have seen the cut on the capture, with the 8-frame technique. Well, they didn't know if they liked it, but we haven't heard anything about a reshoot, so I guess they are warming up to it. Time will tell, as this is a technique that a lot of people in television entertainment are not familiar with yet.

It has been quite a drama just trying to get to location in the morning. Navigating the urban sprawl of Buenos Aires is tough even for the Portenos. We were 45 minutes late yesterday because Billy's assistant couldn't find the location. This morning it was raining heavily, so she was late and we took a cab. When the driver started to stop and ask for directions, we pulled Billy's GPS out and stuck it out the window. Thanks to the GPS we were right on time. We kept giving the driver directions, and I don't think he quite knew how we were getting our information.

♦ The latest word from Turner is that they like the 8-frame stuff on the capture very much, and that the footage from the "prisoners's bedroom" is the best stuff they have seen in a long time. Great!

The last few days were devoted to cleaning up some previously shot sequences with additional footage, and scenes that no longer involved American actors so that they could be sent home.

One night we were on a camera car doing car-to-car footage. At two in the morning on

Liberator Avenue, it sometimes seems as if the only other traffic is drunks and drag racers. We are doing U-turns with a camera car and antique picture vehicle, and there is no police protection. Come to think of it, there never has been a cop even close to our set. One would think that in a country that derides itself for its official corruption, the cops would have the movie business sewn up for featherbedding. But I suppose that in order to profit from featherbedding you have to show up, and that smacks of work.

♦ The last day was spent in the country, a pleasant change from the crowded streets of Buenos Aires. The film opens with an allegory. We see gauchos herding cattle, their whips cracking as they drive them into a waiting train. The train travels over the countryside until it passes by Eichmann's house. He and his young son count the cars on the train.

The last shot was a night pass by of the train to cut with Garibaldi Street. We got the shot on the first take, followed by champagne and lots of hugs. My camera crew presented me with a very nice belt, silver buckle and all. They thanked me for teaching them so much. It was very touching.

Billy and I did our first postmortem in the car, on the way back to the hotel. This has been our 13th film together.

♦ Today was a wrap day, so there was not really much for me to do except pay the hotel bill, collect equipment, and pack. I went down to La Boca in the afternoon, but there wasn't much to see. The cab driver on the way back was quite friendly, and I had a sort of a conversation with him in Spanish. It is like learning tennis when you get a bit of a rally going, pretty exciting. He would say something and I would understand it, and I would reply and he would understand. Pretty cool. I should make an effort to learn this language.

♦ I fly out at midnight for Miami. The Kool-Aid commercial is happening and my son Jonas will be my second assistant as well as my roommate. From Eichmann to Kool-Aid — I do love variety! ♦



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Above: Dr. Kessler (Pierce Brosnan) pleads for peace with the ruthless Martian Ambassador. Interactive green and red lighting heightened the scenes of annihilation, simulating the effects of death-rays. Right: "It was pretty amazing to shoot in Washington D.C., says gaffer Ian Kincaid (center), with Peter Suschitzky (left) and key grip Michael Coo (right). They said it would never happen, but next thing we knew, we were driving tanks right up to the White House."

"Being the English gentlemen that he is, Peter Suschitzky has a tremendous sense of humility about his work," remarks operator Ray de la Motte, whose recent work with Stephen Goldblatt, ASC includes *Batman Forever* and the upcoming *Batman and Robin*. "To do this kind of high-end movie, you have to have a lot of talent and experience. Otherwise, you're in a lot of trouble."

"Some cameramen are very visceral and technical and know exactly what they want, but Peter is a quiet, soft-spoken artist," observes *Mars Attacks!* gaffer Ian Kincaid, whose credits include *Casino* and *Heaven & Earth* with Robert Richardson, ASC. "He's not the guy who says, 'I want a 20K there.' Instead, he inspires his crew and is open to suggestions. He'd often say, 'Well, show me.'"

With humor, Suschitzky responds to these descriptions of his on-set style by saying, "Of course I know where I'd like the 20K, but I if I spell everything out then key people such as the gaffer are going to feel uninvolving and uncreative, not feeling that they can contribute. Naturally one cannot have a discussion group about every lamp placement, so I'll often

say exactly what I want, but at other times, I manage to involve my key crew members. The trick is to allow enough space for people to feel that they really can be, and are, part of a creative process. That



way, everybody functions better and we all have more fun."

The son of noted cameraman Wolfgang Suschitzky, who emigrated from Vienna to Britain in the mid-1930s to escape Fascism, Peter Suschitzky perhaps elicits such admiration in part because his career reflects an attraction to the unusual. After his education at a Parisian film school, Suschitzky shot the 1966 feature *It Happened Here*, a semi-documentary fantasy detailing life in England had the Germans won World War II. Since then, the cinematographer's eclectic filmography has been marked by strong collaborations, including

Leo the Last and *Where the Heart Is* (directed by John Boorman), *Lisztomania* and *Valentino* (Ken Russell), *The Empire Strikes Back* (Irvin Kershner), the American remake of *The Vanishing* (George Sluizer), and *Immortal Beloved* (Bernard Rose). Suschitzky has also shot a quartet of provocative projects with Canadian director David Cronenberg: *Dead Ringers*, *Naked Lunch*, *M. Butterfly* and, most recently, *Crash*, based on the novel by J.G. Ballard (to be covered in an upcoming issue of AC).

When asked what attracts him to such projects, the cinematographer replies, "They are movies with a strong personality, unlike the majority of pictures, which are like fast food — having no particular flavor, needing no chewing and leaving no trace."

This disposition brought Suschitzky to the attention of director Tim Burton (*Batman*, *Ed Wood*), who was seeking a cinematographic collaborator for *Mars Attacks!*, a sardonic sci-fi spoof based on a set of 55 bubblegum trading cards of the same name. The cards first appeared in 1962, thrilling children and shocking their parents. Originally entitled "Attack from Space," the cards sold for a

penny each and bore headlines such as "UNSPEAKABLE EXPERIMENTS" and "PRIZE CAPTIVE" above racy color images that included humans being subjected to medical experiments aboard flying saucers, and skull-faced spacemen grappling with nubile coeds. After adult tempers flared, the series was reworked as "Mars Attacks!," and the price of the cards was raised to a nickel each. The cards were just a footnote in pop culture history until the set was reissued in 1985. In

after I looked at the old films. But a movie doesn't really start to come together in my mind until I take a look at the cast, including something of what they're going to wear, and the sets and locations. I'm not the sort of cinematographer who knows firmly and consciously ahead of time exactly what he's going to do. I have a look at all of the various elements, spin them around in my mind and start to work on them.

"In the case of *Mars At-*

Wynn Thomas, whose credits include The Five Heartbeats; A Bronx Tale; To Wong Foo, Thanks For Everything, Julie Newmar; and an impressive body of work with director Spike Lee: She's Gotta Have It, School Daze, Do the Right Thing, Mo' Better Blues, Jungle Fever, Malcolm X and Crooklyn.

While discussing the project with Thomas, Burton again used the vintage *Mars Attacks!* cards as a reference. The designer remarks, "When you look at those

Below: Las Vegas realtor Art Land (Jack Nicholson) in his glitzy, space-themed office, designed by Wynn Thomas.

Nicholson also portrays the President in the film, and Kincaid reports that "the environments really controlled how we lit those two characters. We gave the President a little more respect — diplomatic, portrait lighting — but once Jack turned into this renegade realtor in Las Vegas, we didn't worry about making him look presidential; we were more garish."

Galactic Antics

Cinematographer Peter Suschitzky, BSC and a team of experts help director Tim Burton destroy the world in *Mars Attacks!*.

by David E. Williams

1995, a comic-book collection of the same material was published; it caught the eye of Tim Burton, who became interested in bringing the Red Planet's bubblegum baddies to the big screen.

Curiously, it was one of Suschitzky's most peculiar credits that piqued Burton's interest in the cameraman, who explains that "Tim got very excited when he learned that I'd photographed *The Rocky Horror Picture Show*. He said, 'That's one of my favorite movies!' He's got a very original slant on things, no doubt about that. I've admired his films, and I felt honored to be asked to work on *Mars Attacks!*. I had a brief initial meeting with Tim, and he showed me the trading cards — the point of departure," Suschitzky adds. "He then left me some videodiscs of science-fiction movies from the Fifties, things like *Earth vs. the Flying Saucers*. He just said, 'See what you think.'

FIRST CONTACT

Outlining his process for visualizing a film, Suschitzky says, "I'll get a very vague feeling after I've read the script and talked with the director. Of course, I had an extra element or two to consider

tacks!, the film is a very complex patchwork quilt — at least it was during its making, since it was shot in the studio and then at many different locations. For that reason, my main interest was to give it a kind of unity in look, which is naturally any cinematographer's concern."

Burton also sought out the expertise of production designer

cards, they're frightening in a way because there is so much going on, although there's also a visual simplicity to them. We didn't know if audiences would be comfortable watching a movie that looked exactly like that, so we tried to choose elements from the cards and re-create their spirit, instead of mimicking the specific colors, images or even shapes.



"There is a certain lurid, Technicolor quality to the illustrations," Thomas adds. "We decided to use those strong colors as accents, rather than doing the whole film in very bright primary hues. That would have been impossible."

Unlike on *Do the Right Thing*, Thomas didn't want to tie colors to specific characters or emotions in *Mars Attacks!*. He notes, "This film was a bit more free-form. But I've never approached color with charts and plans, so it's always an instinctive response to what I want to say about a set or a character. It's difficult to intellectualize or discuss it. But at some point, especially on a film as big as this, I had to look at the design and see how a color pattern was emerging through each scene. Then I made sure I was consistent throughout the rest of the film."

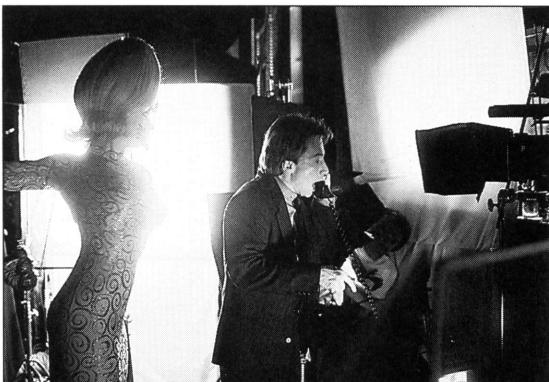
Remarks Suschitzky on his collaboration with production designers, "This is always a key relationship. It's easy to make something interesting out of a beautiful set, and it's really quite difficult to make something interesting out of a frumpy set or one that is ill-conceived. Wynn and his crew were always willing to discuss and alter the height of a wall, or change the wall itself. For example, we had a set called the War Room, and they wanted to build it on as grandiose a scale as possible — right up to the studio perimeters.

had to ask them to lower one of the walls so that I could install my lighting, but we never had any real problems over that kind of thing."

Suschitzky says that he ultimately had "much more time than I ever thought I'd have" during prep. He notes, "The film was delayed to the point where I asked to be released from my contract so that I could go shoot *Crash*. But the advantage of my being involved with such early preproduction was that I could have an understanding of what the sets would be like, as well as some input as to how they would be lit and photographed. I was also able to get involved with the special effects."

PLANS FROM OUTER SPACE

After returning from *Crash*, Suschitzky confronted one obstacle in crewing up for *Mars*



Attacks!. "I have regular crews in different parts of the world, including one in Canada since I've worked there on five movies with John Boorman and David Cronenberg," he says. "But I don't have a crew in Los Angeles, because I don't shoot there regularly. Fortunately, on *Mars Attacks!* I was blessed with perhaps the best crew I've ever had, thanks to recommendations I'd gotten from several people."

One of those referrals led to his new operator, Ray de la Motte, who says, "Peter and Stephen Goldblatt are old friends, and Peter's regular operator wasn't available to do *Mars Attacks!*. I was thrilled that Peter offered me the movie, because I've been a Tim Burton fan for a long time."

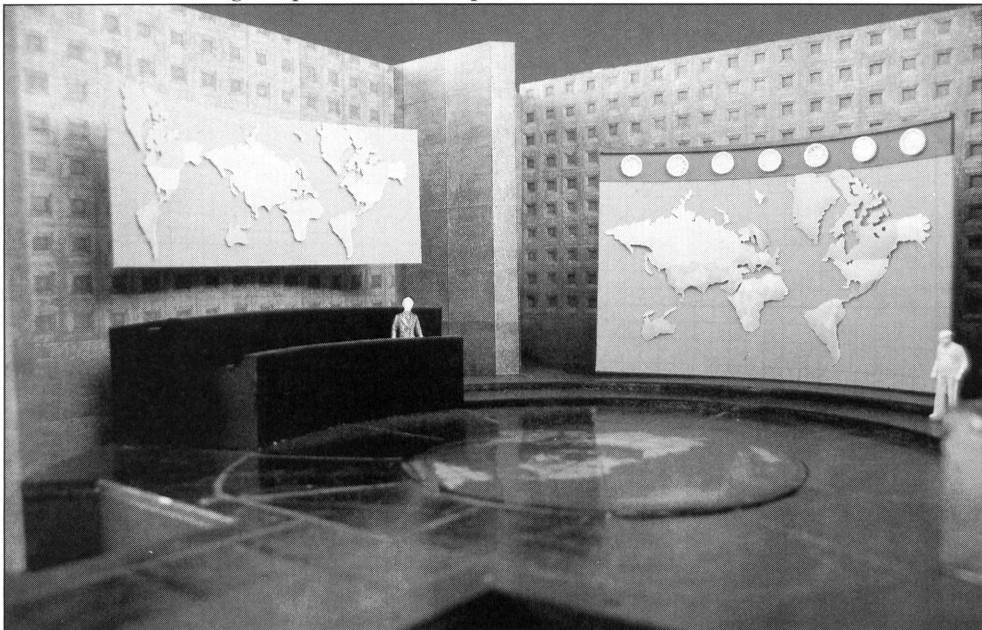
Ian Kincaid, whose name had come to Suschitzky's attention

some time earlier, was brought in as the gaffer. "I had my first meeting with Peter at the Hollywood Cemetery," he recalls. "He had called me about a few other pictures in the past, and it just worked out this time. We had met once before, and I'd heard great things about him. When I first saw *Naked Lunch*, I asked, 'Who is this guy and how do I get to work with him?'

"The style of Peter's that was most noticeable to me is that he will often do this frontal — not flat — lighting that is all chopped up and diffused in different ways," says Kincaid. "Sometimes it's just off angle to the lens, sometimes it's right on it, but when a character passes through it, the lighting reveals all of these different levels. It's a very signature approach, and there are a lot of layers to it."

"Peter and Tim had a terrific collaboration," de la Motte says. "My job was to be on their wavelength. Tim does a lot of wide-angle shots and strange framing, which took a while to get into. This film is like a cartoon, in that the compositions are designed to get as much information as pos-

Right: *The Martian spy (Lisa Marie) takes out another puny earthling (Martin Short). Says Kincaid, "For frontal fill, we used 4' x 4' muslin frames, with colored Mini-Brutes coming through one and a Blonde bouncing off the other. We often used 4' x 4's of bleached or unbleached muslin. We never had to throw them away, unlike bounceboard." Below: Thomas' scale model for the War Room set. Both Suschitzky and Kincaid found the models extremely useful in their planning for practicals and other lighting.*



sible into one frame. It's a bit more formal, but there's less of a need to punch in for a close-up since it's unnecessary. Besides, comedy is essentially a two-shot. You want to see one person react to another's timing.

"This is an older visual style, where the camera moves when necessary, but the performers generally played within the framework Tim set up. The actors — not the camera — are selling the situation, which makes it a much more objective vision.

"When dealing with an action film like *Heat*, I find myself allowing the actors to push the frame harder — to push the sideline and add some frustration to the shot," de la Motte adds. "*Mars Attacks!* is a comedy, so if the actor hits a sideline, it makes the audience uncomfortable — which is the wrong feeling for a film like this."

But isn't such formalism a stylistic contradiction when photographing a fantastic world? "Tim is a bit of a contradiction himself," de la Motte offers with humor. "At one moment, he frames for a specific reason, then he then goes completely against that in the next shot. He's like

Terry Gilliam in that he sees things in an unusual way and is very precise about it. He'll go over a set with a finder for a half an hour looking for just the right shot to convey what he sees in the scene."

While Burton visualized *Mars Attacks!* in a 2.35:1 frame — his first widescreen picture — the shooting format was partially determined by the fates as a result of Burton's initial plan to create the Martian characters with stop-motion animation. Recalls Suschitzky, "Pixillating the Martians necessitated between 12 and 15 camera units. There was no way we could get enough anamorphic lenses to feed 15 cameras. So Tim asked me, 'What do you think of Super 35'?

"Of the Super 35 movies I



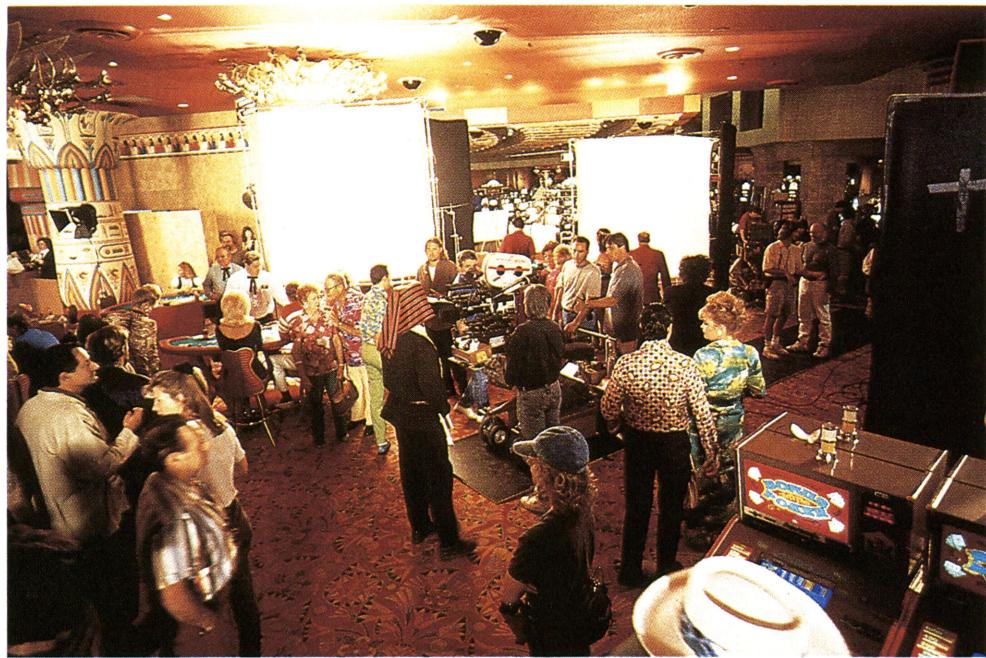
have seen, apart from one or two James Cameron films — and I think he leans fairly heavily on the postproduction department to get what he wants — I have sometimes been appalled by the format. So I said to Tim, 'Let's test it, but we must take it through to its final stage.' In other words, we tested it side by side with normal 'scope and took both negatives through the dupe stage. When we saw the results, it seemed clear that Super 35 was inferior.

"However, it was going to be impossible to film *Mars Attacks!* in 'scope because too many cameras were required for the stop-motion work. Our decision to shoot in anamorphic was made for us when it was decided that the

Martians would be created via CGI."

Mars was therefore shot using Panaflex cameras and Primo anamorphic lenses. "Up till now, I haven't come across an optical system that looks better than the Primos," says Suschitzky, "although some of the older anamorphic lenses are also very pleasing."

Considering the graphic, color-filled atmosphere of *Mars Attacks!* and the lighting situations that the script, locations and anamorphic format would demand, Suschitzky conducted extensive side-by-side tests of Kodak and Fuji high-speed stocks to determine which would best serve the production. "I had used some high-speed Fuji stock on *Crash*, and was considering using some on *Mars Attacks!* as I very pleased with it," the cinematographer reports. "But the studio had a preference for Kodak stock. Therefore, we used a mixture of 5248, the best Kodak stock for what we were doing because of its definition and color saturation, 93 and 98 — shooting a proportion of interiors on 48 and the rest on 93.



Above: On location at the Luxor. Says Kincaid, "We had very low ceilings in there. Our basic plan in wider shots was to lock in the shot and run big sources — Dinos and Maxi-Brutes — through muslin all along the frame line. Then we'd use Leikos to pick up elements of the ceilings."

Right: A pair of freedom fighters (Tom Jones and Annette Bening) confront the Martians. "The Young Electric Sign Company is the lighting graveyard," enthuses the gaffer, "full of old neon collected from all over. The art department handled all of the electrical work on the signs, but we then had to connect them on cues at the last minute to coordinate with death-ray blasters."

"I generally prefer a saturated look these days, so I made sure that [the timing lights] were pretty high on the scale. It's something I generally do as a matter of course. The postproduction stage is helped if you print in the upper 30s or low 40s."

INVADING VEGAS

As the Martians arrive in Earth's skies, their saucers hover over such important cities as Washington D.C., Paris and... Las Vegas — which makes perfect sense, given *Mars Attacks!*' decidedly bent perspective. Yet while the gambling capital may superficially seem to be "ready made" for the pictures' colorfully cracked aesthetic, this portion of the shoot was complicated from the beginning. Recalls Wynn Thomas, "People usually think there isn't so much for the production designer to do on a location, but the job in that situation is to tie the elements you find together with the rest of the picture. You're not just choosing locations and things at random, and there has to be a process that allows you to do that."

"We did a lot of scouting in Vegas and were much more critical about our choices than we were in some other places. It's ironic, because people think Vegas is the kind of place where you can just turn the camera on and it'll



look great. But you really can't, because there is action you're going to have to do that dictates those choices. You have to look at how the actors are going to move, give the plan some shape and then prepare the space.

"We were going to shoot at Caesar's Palace, but we weren't able to get in there. And the tonality of Caesar's is very different from the Luxor, which is where we ended up. I wasn't able to make any color decisions until we knew where we were going to be, and there were a lot of elements impacting those decisions."

Assessing the degree of difficulty encountered at the Luxor, Suschitzky says, "The main problem with shooting in casinos is that you can only shoot at night, from 10 o'clock onwards. You have to be out by seven or eight in the morning, and you have to clear out

all of the equipment every time. I also had to be careful not to overwhelm the existing practical fixtures, which would pose a problem for any cinematographer working there."

Ian Kincaid had worked on three previous films in Las Vegas, including *Casino* (see AC Nov. '95.) "It's always difficult to film there, but the Luxor was very cooperative," the gaffer says. "It's a very open, spread-out space and they made several gaming areas available to us."

"We knew we weren't going to have the kind of control we had on *Casino* [at the Riviera], where we brought in two trucks' worth of lighting, installed it in ceiling rigs, set up dimmer boards in a fake slot machine and ran cable. Here, we had to move everything back out each night. And we

had a lot of cable. Plus, because the casino area [at the Luxor] is round, there weren't a lot of places where we could bring it in; we could often see across 200 feet of background in wide shots. But we had to get the exposure up, because we're shooting anamorphic."

"In the end, I don't think we felt any great restriction," Suschitzky says. "We just had to plan the direction we were going to shoot in reasonably carefully. We did manage to swing around and shoot in the completely opposite direction quite a few times during improvised moments. I was able to use color boldly because it seemed appropriate in that location."

"Vegas is a night town, so most of our exteriors there were done at night. We had some quite large exteriors that had to be lit every night and cleared away each morning. Outside, we were probably in the f3.5 range on the high-speed 98 stock."

For scenes in which Martians rampage through Las Vegas, vaporizing all humans in their path, Suschitzky and Kincaid devised a lighting system to add effect lighting supposedly created by

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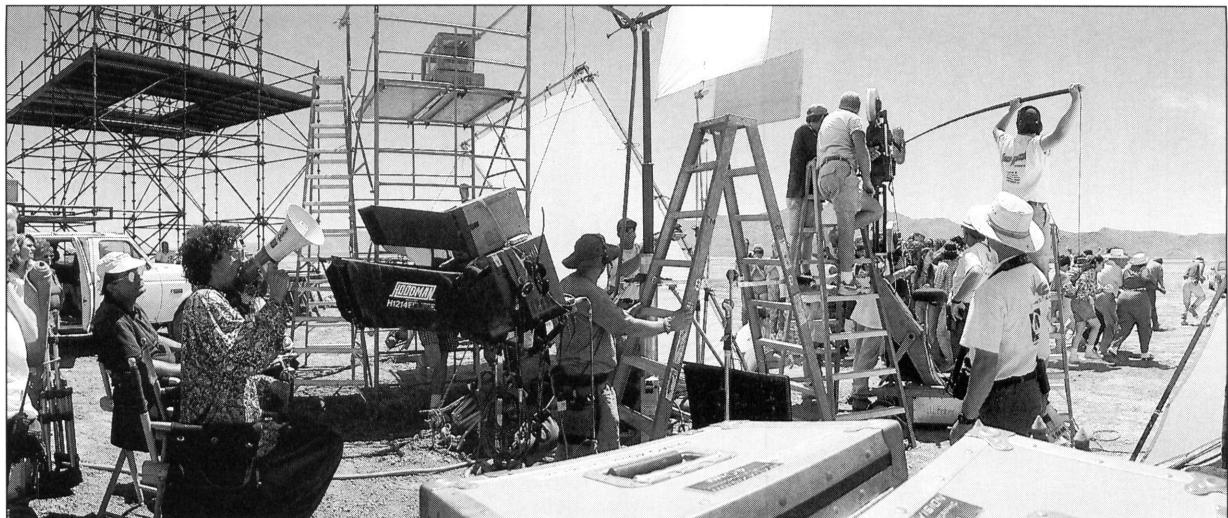
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Burton (with megaphone) rallies the troops. For a daytime desert landing and ensuing battle sequence, staged in the Nevada desert, "we used a lot of bounce and LTM 18K HMLs," says Kincaid. "I don't even order 12Ks anymore because the 18Ks really look like sunlight and they're a replacement for the arc. And with the wider-based Supercinavator stands, the 18Ks are very stable even up high in the air. We had four of them out in the desert most of the time for when we couldn't bounce light in — we were working with a high level of light because of both the sky and a lot of bounce off the ground."



the aliens' raygun blasts. "Numerous scenes used interactive colored lighting — creating a crashing, explosive type of effects," says the cameraman. "We had a lot of fun blasting the actors with rayguns."

As Kincaid describes, "The Martians have two different death-rays. The green one oscillates in a circular fashion and the red one undulates. So we used gelled Dinos — either very strong red or green — that we could focus on whatever was being blasted. That's why we ended up calling the rigs 'blasters.' Tom Mead rigged up a series of manual switches, and they'd just wash out everything in a staccato burst of overwhelmingly powerful light. With that push-button control, we could run up to six blasters of up to 24K each. We used the same rigs in the desert battle sequence and for the scene in which Congress gets wiped out."

LANDING ZONES

All of the sets for *Mars Attacks!* were built across seven soundstages on the Warner Studios lot in Hollywood. Even cursory inspection of images from the film reveals a lot of practical lighting. "That was something I specifically requested," says Suschitzky. "I don't think there was much practical lighting built into the sets, so I suggested the various areas where it would help the visual interest of the set when we photographed."

Practicals were also motivated by how Burton planned to

shoot the stages. "Tim's set is one of his characters, and, again like Terry Gilliam, he wants to see it," offers de la Motte. "Tim often starts a scene with a master shot that is wider than most, to show it all off. You can hardly see the actors because they're so small, but that adds to the tone of the picture. If you let that play without a punch-in [shot], it's funny. The scene and the set add to each other. [I think that's interesting] in an age when a lot of directors want to use a 300mm lens on every shot, which often leaves the audience wondering where the hell they are."

Fortunately, Burton's eye for architecture was fueled by the spectacular settings of *Mars Attacks!*. "The film's retro-futuristic look was a big discussion," says Wynn Thomas of his set designs. "Tim wanted everything to appear very generic so that we wouldn't have a sense of what time period we were in. But again, it was a question of trying to simplify all of the images and the sets — making them more graphic. You usually build character into sets with detail and clutter, but here it was a matter of keeping the lines and shapes clean. The War Room is a good example of that; in the end, it's really not much more than a map and a chair."

Studying the War Room set, it's impossible not to think of production designer Ken Adam's work on *Dr. Strangelove*, photographed by Gil Taylor, BSC in spectacular monochrome. Thomas admits, "That set has stayed with

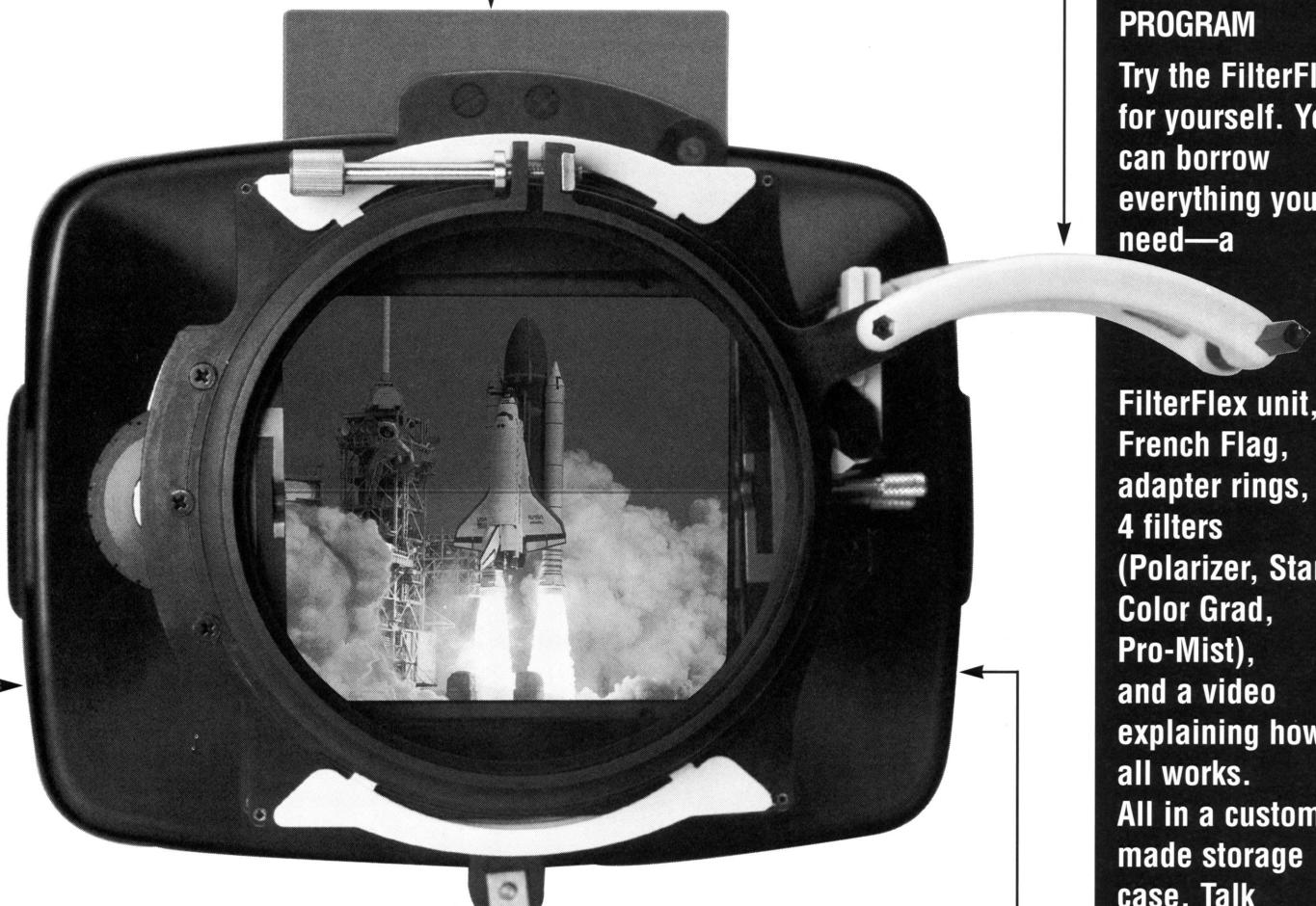
me for years. We couldn't better it, but my solution for our War Room, which influenced the entire design of the picture, was that *Mars Attacks!* is about aliens invading the Earth. So on almost every set, there is an image of the globe — there are maps everywhere. I also wanted the final image of the President (played by Jack Nicholson) to be a shot of him sprawled out on a map of the world — which became the circular floor of the set. There are a lot of circular shapes — Earth symbols — throughout the film. But it all stemmed from that final image of the President."

Detailing the lighting approach to the set, Kincaid says, "We had 1,200-watt Pars illuminating up or down the walls, depending on whether we had the room at the top or bottom. Then we had ellipsoidal fixtures on all of the clocks to give them a glow. The map on the wall was lit from behind and outlined by neon. To give us some strong backlight from above, we used 10Ks and 20Ks."

"We also had a circular overhead rig composed of exposed Kino Flo tubes and 1,200-watt Pars, which provided these downward shafts of light that would make nice pools of strong toplight around the perimeter of the floor map. The centerpiece of Kino Flos could be moved up and down on chain motors to flag out the background and cut the top of the open ceiling. Of course, the lights were all on dimmers."

Another key set was the office of glitzy Las Vegas realtor

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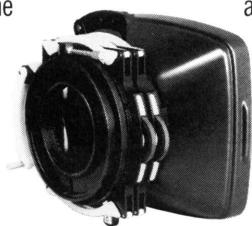
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Art Land (also Jack Nicholson, in a Peter Sellers-like multiple performance), who seeks to cash in on the Martians' arrival. "In the script, the description just said 'his office,'" says Thomas. "But his hotel was called the Galaxy, so I did the office set with this kind of space theme—dressed in blues, with a suspended globe in the back."

The exterior of the Galaxy was the real-life Landmark Hotel, itself a spindly, space-themed structure with a circular main section some 20 floors up—not unlike Seattle's Space Needle. Recalls Kincaid, "This office was a pie-wedge shape with a domed ceiling and one wall that was just a giant window.

"We used two lights coming in on this room, motivated by the fact that the wall was glass and the early morning sun and the lights of Las Vegas would be coming in as the Martians attack. The crew called [the fixtures we used] 'bam-bams'—they consisted of 12 banks of nine FCX globes coming through heavy muslin diffusion on a 12' x 12' frame, which created this huge soft source. The frame was then mounted on the lamp, so it would tilt and pan with it. It's really called an Illuminator.

"There were also a lot of great practicals, but the production design and art departments did a great job by building models of the sets before they were constructed. That way, we could work on them together and keep the lighting honest with the design of the spaces."

Spaceship interiors are seen in several sequences. Notes Thomas, "Tim decided that the design of the saucer interiors should be influenced by the playfulness of the sci-fi films, cartoons and drawings of the '30s, '40s and '50s, which would take real shapes and exaggerate them into fantasy shapes. There's a big contrast between the American laboratory, where they dissect a Martian, and the Martian lab, where they experiment on an American scientist. The Martian world is much more complicated and dependent on hardware, while the lab on Earth is a sterile, circular space."

Suschitzky adds that the saucer interiors for *Mars Attacks!*

were created as "large miniature sets involving the CGI Martians. They were shot at Industrial Light & Magic (see separate story), and I wasn't involved in the actual shooting of those because they were filming in parallel to the main shoot. However, I did stay in contact with the director of photogra-

"I feel that the effects mustn't drive the movie, but be at service to the narrative..."

— Peter Suschitzky, BSC

phy [Pat Sweeney] who was in charge of shooting the miniatures."

Detailing the lighting setup on the sparse American lab, Kincaid says, "The room was circular and we could shoot 180 degrees of it. We lit it with fluorescent fixtures installed in the ceiling disc that floats and tilts above the operating table. We had 3200°K tubes in there, but we wanted a Coke-bottle green color, so we tested several gels and came up with the Rosco #190 Cosmetic Emerald gel, which also has a bit of diffusion in it as well. We then bounced in a couple of 5Ks into 4' x 4' muslins with half CTB on them to reflect off the metallic finish of the dissection table's platform. Outside of the room, we had a 20K with some 106 gel—a primary red—for the backgrounds seen through the observation viewing windows. Then we put a couple of Kinos around the tops of the windows to illuminate the people peering in.

"It was a very small stage with a simple top light, yet it was also a difficult set in that it was like lighting cars—you have to be a good pool player and know your angles. It's not about putting light on something, but reflecting light off of it. Because the scientists and his assistant were wearing these glass dome helmets, we had to eliminate all reflections of the camera and crew—by dressing everyone entirely in black—and then add reflections back where we wanted them."

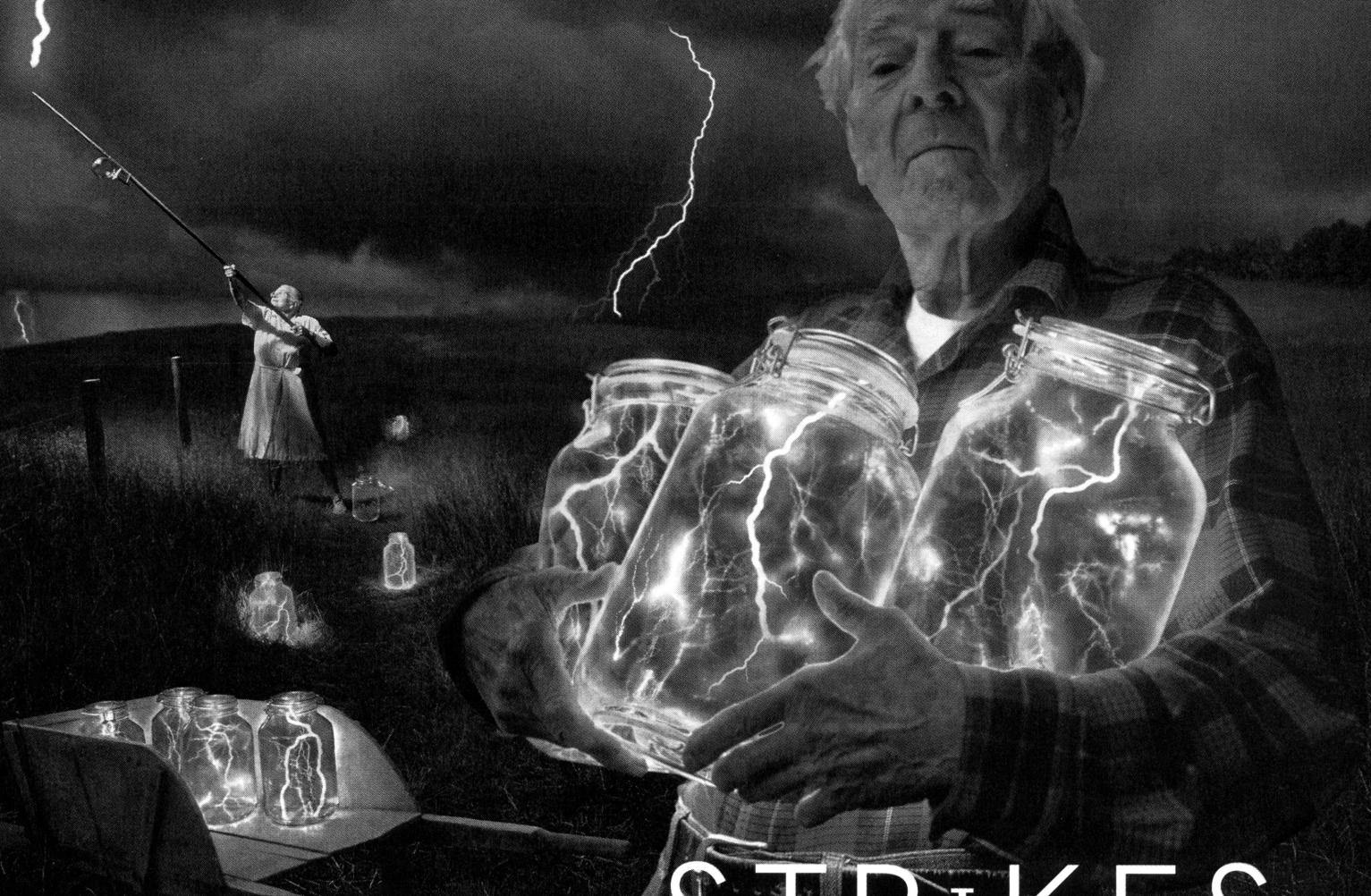
In another sequence, a Martian spy disguised as a woman with an outrageous bouffant

hairdo infiltrates the White House by making amorous advances on a philandering press secretary. He quickly ushers her into a secret room—a dark space with a central salt-water aquarium that seems to provide the key lighting. "I tried to get a watery feeling, but not quite an underwater look," says Suschitzky. "That was perhaps the toughest set I had to deal with because it was very difficult to bring the walls to life. The art department had added speckled gold dust to the walls to relieve the blackness. The tank was mainly lit from overhead with Kino Flo-type lamps and then some lights on the sides."

Kincaid elaborates, "We couldn't heat up the tank too much with our lights because the fish would have died, so we had the lamps on dimmers. The tank itself was built over an empty cabinet, which allowed us to put Pars underneath. There was also some backlighting in that scene for wide shots, and we lit all of the bookcases with fixtures that were recycled from the War Room, along with more ellipsoidals—Leikos and Source Fours."

While obviously enthused by the result of his work with Burton, Thomas, Kincaid, de la Motte and the rest of the *Mars Attacks!* team, Suschitzky found that his role on the production continued even after principal photography had been completed. As this story was being prepared in late October, Suschitzky was still on hand to lend his eye to postproduction matters. "If I do a movie with special effects," the cinematographer says, "I feel that the effects mustn't drive the movie, but be at service to the narrative, as they are in *Mars Attacks!* or in *The Empire Strikes Back* and *Dead Ringers*."

Have past experiences helped him relate to a film that was realized with the help of so many other people? "This is my first big special effects film for some time now and I'm expecting to be excitedly surprised by the final movie," Suschitzky concedes. "Past experiences can help support you, but the present is always full of surprises in moviemaking, as in life." ♦



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Strange Invaders

Industrial Light & Magic and Warner Digital Studios help assemble the Angry Red Planet's retro-futuristic forces for *Mars Attacks!*.

by Ron Magid

Gestures of peace in the War Room? Not likely! Creating the CG Martian Leader's sequined cape presented major obstacles. "We used Softimage skeleton structure in the wireframe stage to animate the clothes," Ellen Poon reports, "then we enhanced the cape's billowing with our shape animation in Cari. Sometimes we'd use noise cues moving through their capes to create the effect that a wind was blowing." When the highly reflective, sequined material proved tricky to create, Poon wrote a custom shader which was further evolved by Robert Marinic.



Even more challenging than formulating a coherent feature-film narrative from the original *Mars Attacks!* trading cards was bringing director Tim Burton's whimsically skull-faced, big-brained Martians and death-ray dealing saucers to life, a task that taxed the creativity of the visual effects firms brought into the fray.

Burton first envisioned the Martians as stop-motion puppets, a technique used in *The Nightmare Before Christmas*, which he produced. Initially, the filmmaker hired Barry Purvis, known for his work on a number of stop-motion Shakespearean pieces, as his animation director. Soon, Purvis was gearing up a Hollywood facility to shoot all of the puppet effects. The British company McKinnon and Saunders was contracted to build some half-dozen exquisitely detailed, highly articulated Martian figures. Then *Mars Attacks!* producer Larry Franco, who had just finished *Jumanji*, approached ILM

visual effects producer Mark Miller, who headed up the team completing that film's effects (see AC Feb. '96), about combining the stop-motion Martians with live actors and action background plates. "Larry asked us to put together a bid on compositing their models with our background plates," Miller recalls. "But we suggested doing 3-D CG Martians, and Larry asked, 'Can you show me a test?'"

Miller quickly recruited CG supervisor Jim Mitchell, who had modeled, animated, technical-directed and supervised effects for *Jumanji*, and animator Dave Andrews, who had also recently completed that project. Their five-second test of some rough CG Martians composited into an old background plate was then presented to Burton. "The Martians were yanking the bumper off a car!" Miller describes with a laugh. "Tim loved it so much that he wanted to take the whole movie CG."

Mitchell became ILM's vi-

sual effects supervisor for *Mars Attacks!*, while Andrews became their animation supervisor. Miller quickly brought other *Jumanji* veterans aboard, including Ellen Poon, who was named associate visual effects supervisor.

As the transition to CG was made, Franco concurrently discussed the development with Warner Digital Studios vice president Mike Fink, with whom he had previously collaborated on *Tango & Cash* and *Batman Returns*. At the request of Burton and Franco, Fink became the visual effects supervisor for WDS, which was additionally supported by digital supervisor Guy Williams and producer Lauren Ritchie.

In essence, the primary work on *Mars Attacks!* was divided between these two visual effects firms, with ILM handling the Martian characters in approximately 250 shots and WDS focusing on the extensive flying saucer sequences and other scenes of glo-

Photos by Sean Casey and Bruce W. Talamon courtesy of Industrial Light & Magic, Warner Bros. and Warner Digital Studios.

bal chaos, which would require about 150 shots.

As principal photography began on Warner Hollywood soundstages and various locations, Fink, Mitchell and Poon oversaw shooting of the background plates for their respective effects. Since WDS is based in nearby Burbank, Fink was also able to lend a hand to prep or shoot plates for his counterparts at San Rafael-headquartered ILM when necessary. Both teams often worked side by side with mechanical effects supervisor Michael Lantieri (*Jurassic Park*, *Casper*, *Congo*), who would create on-set physical interaction with the as-yet unseen invaders.

To help the actors, technicians and even himself better visualize the Martians, Burton commissioned Global Effects (who crafted Vlad the Impaler's armor for *Bram Stoker's Dracula* and the environmental suits seen in *Outbreak*), to build two complete Martian costumes. These otherworldly outfits proved handy for rehearsing camera moves, interaction between cast members and Martians, and some of Lantieri's practical on-set effects. "We used them extensively to help block out our action," Lantieri says. "This kept us from looking at a plate after production ended and suddenly realizing that we had to squeeze a Martian into the right-hand corner of frame."

George Ruben redesigned the Martian head, widening its jaw and cheekbones to fit over human facial features. The spacesuits were exact duplicates of those worn by ILM's CG Martians, complete with corrugated legs. They were fabricated with foam covered in vinyl and painted with green vinyl paint. The masks were rubber; the domes, vacuformed plastic. "The first time these little Martians with the big brains walked on stage," recalls Global Effects' Chris Gilman, "there was quite a reaction from the actors!"

The Martian suits were completely replaced with ILM's CG creations. However, the animators often referenced the suited-performers' natural shadows and mimicked both the reflections in the practical glass domes and the way light fell on the costumes. Glo-

bal Effects additionally contributed some significant on-camera props, including an autopsied Martian corpse.

Much pre-planning was required between Lantieri, WDS and ILM to mesh practical on-set effects with the CG Martians: "We looked at each scene and decided how many Martians would be doing each action, and how each of them would do it. We had to decide just how they would interact with things, like opening a door or a window. Then we built radio-controlled props that moved by themselves, or puppeted things on various rigs, always being careful

against the door in a mirror image. Then, using some powder releases and bungees, we slammed a rig through the door and right into camera. Since it was painted like the back of the set, it magically disappeared after leaving a 6' hole, like a tin can opening. The rips and tangs curling back happened all at once, in live-action, at regular camera speed."

Lantieri even had a hand in destroying Las Vegas' Landmark Hotel — already slated for demolition — which serves as the exterior of the Galaxy Hotel, the headquarters of real estate wheeler-dealer Art Land, played



to avoid that floaty 'wire' look. We tried to put our rods and wires at angles that you wouldn't expect: from above or from the other side, or going right through a character we knew was going to be added in CG."

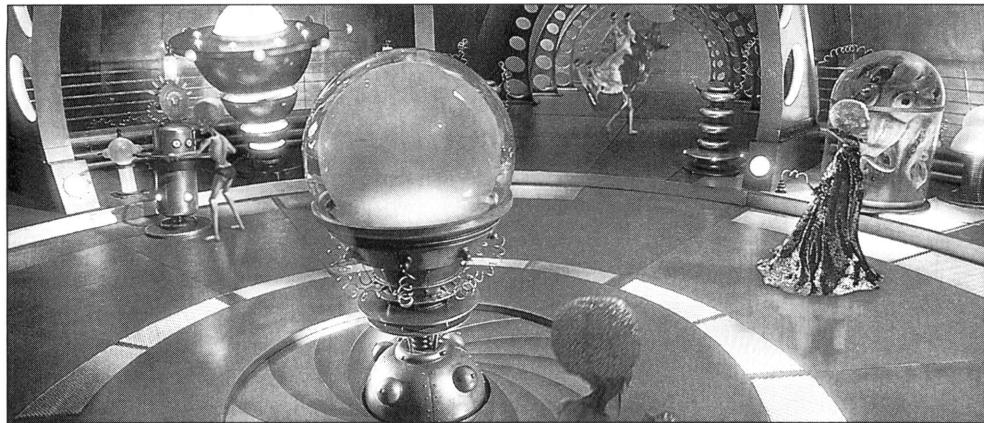
One of the more complicated effects involved creating a steel War Room door blowing open from the blast of the Martians' weapons. Lantieri showed Burton several tests, but nothing looked quite like the scene the director had envisioned. "Finally I said, 'Just draw me a picture!'" Lantieri remembers. "So he did one and said, 'I want it to open up just like that.' Picture the end of an exploding cigar, curling and splitting, substituting a full-scale, heavy metal door.

"We actually built a full-sized door that sprung itself open and curled back and twisted. It was made of really thin metal that we acid-etched. The curled shapes we wanted were already sprung back

by Jack Nicholson. Lantieri worked very closely with Mike Fink and WDS on this effect, as they would supply the flying saucer and raygun effects that supposedly brings the structure crashing down. "In December of '95, at the start of pre-production, we went to the Landmark and figured out how to cover it with cameras," Lantieri recalls. "I then met with the demolition company and worked with them in preparing the pyro on the building. We wanted to make it do an interesting fall, which we pretty much achieved."

The second half of the sequence, the destruction of the Galaxy's interior, was filmed at the end of the production schedule. Lantieri's crew constructed and rigged the glass-enclosed penthouse boardroom set with gags that would hopefully create the effect of it being inside the Landmark Hotel as it toppled over. "All of the glass shatters, columns fall, the floor opens up, swallowing the

A saucer attacks the Washington Monument and a troop of Boy Scouts. Created by Warner Digital Studios, the spacecraft were primarily visualized in CG, though scale models were utilized for shots of the ships crashing into buildings or each other. Creating the reflective surface of the CG saucers proved difficult, as did giving the nearly featureless design a sense of scale.



Above: The sparse saucer Control Room is dominated by an hour-glass-shaped platform supporting a massive crystal ball, which the Leader uses to observe what is happening on Earth. **Conversely,** the Operating Room (production sketch, right) is cluttered with countless specimens in jars: various-sized eyeballs, a giant brain, a cow and a pig (all courtesy of ILM's model supervisor, Charlie Bailey, and his crew), suspended in everything from air to water to Soilsorb, which created some unusual photographic effects.

boardroom table as the structure starts to collapse, and a 14' diameter model of the Earth breaks loose and rolls over Land," Lantieri describes. "And we did that all in one shot, with our A-list actors.

"We made the Earth model as light as possible, but it still weighed 350 pounds, and would have busted both of Jack Nicholson's legs for sure. We built a catcher that sprung up and stretched bungee cords across like a net, and we had people there to jump in at the last minute and stop it. You couldn't stand up in the room because we had about 15 shaker motors going. That gave us a third movement in the room — the camera was moving, the table was moving, the glass was moving, we wanted as much movement as we could get. We used hydraulics to drop a hole in the 30' x 45' floor, which was covered with break-away tile and opened up much like an earthquake gag. Inside the hole, we had steam going and all kinds of debris effects, as though the building foundation were coming up.

"The set had two layers of wall: the first was tempered glass, rigged with about 600 pyrotechnic squibs to shatter it on cue; outside of that was a second set of massive 400-pound walls that rose up on air elevator winches, tearing through conduits and drywall so it looked as if the center of the building was starting to fall. Since we couldn't lower the set, we just raised the outside walls so it looked as if the building were crumbling below. That matched the action of the Landmark demolition."

The Martian saucers caus-



ing this destruction were created by Mike Fink and WDS primarily via computer graphics, although a 25', a 12' and two 6' saucers were used for scenes in which the flying discs crash into water, cities or each other. Aesthetically, the spacecraft are a spectacular tribute to such 1950s science-fiction films as *Earth vs. the Flying Saucers*. "They are wonderfully evocative," says Fink. "They are absolutely 'flying saucers': one saucer inverted over another with a teacup on top."

But they were not so simple to model, animate and light. While the basic saucer seen flying through space only took a day, those with weapons or landing legs were actually quite complex and difficult to create. As Fink describes, "The legs were hinged, linked like arms, and unfolded like crab legs with little spiky feet."

Besides those features, the saucers are perfectly smooth, which created more difficulty when digitally "lighting" their metallic surfaces. "You would think such simple shapes would be very easy to light," Fink sighs. "But when the only thing in a shot for 10 seconds is a saucer and sky, there's nowhere to hide. They're supposed to be metallic objects, so they're reflective — but not like chrome.

They've been in battle, so they have dings in them, but the saucers measure 180' in diameter so the dings are too small to see unless we're up close. We had to develop an incredibly complex layering of shaders and textures on the surfaces of the CG saucers to give them scale."

Fink, digital supervisor Guy Williams and several artists involved with animating the Martian craft attempted to create a sense of scale through the speed of the spaceships' movements, but that strategy also created its share of contradictions.

"For scale, we wanted them to move slowly; but at the same time, these were warships, and they had to move quickly," Fink reasons. "We assumed there were two pilots in the saucer, so there would be subtle little shifts from left to right, but Tim said, 'Too wacky.' Then we pictured them flying a bit like helicopters because they can shoot straight up and levitate, then fly forward. Ultimately, we combined that with our wobbling motion, only it's more subtle and more deliberate. Also, the saucer tops and bottoms counter-rotate, like in *Earth vs. the Flying Saucers*. Tim thanked us because he felt we made the saucers into characters."

The tour de force title sequence of *Mars Attacks!* was about 5,000 frames long and entirely created by WDS using CG. It begins on Earth as a lone Martian scout saucer takes off from behind a barn into the night sky. The next shot has the ship "traveling past the moon and on to Mars," Fink laughs. "It's as if they are next door neighbors: the saucer's there in about 20 seconds! The planets were very stylized 3-D CG models. Earth started out looking like the Universal logo and became more realistic, while Mars looks like an orange left a little too long in the refrigerator."

After the ship arrives on Mars, iris-like shields covering the craters dotting the craggy surface open and thousands of saucers rise to create a battle formation. WDS's Martian landscape, built by Mike

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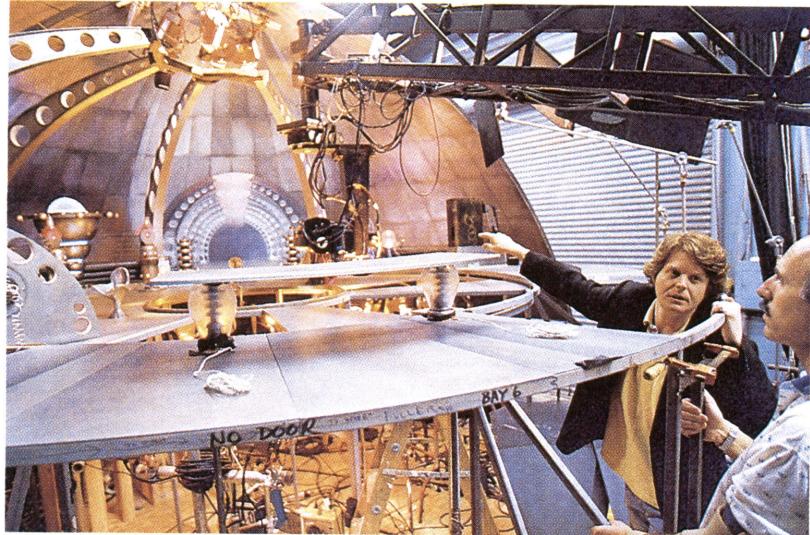


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Right: Shooting the Control Room set. Notes ILM cinematographer Pat Sweeney (far right), "The fiberglass walls of the set weren't perfectly smooth, so I lit underneath the walls, raking the light upwards so it hit at such a glancing angle that it would naturally fall off in the dome's curvature toward the ceiling. That hid a lot of the flaws. Our main instrument was an Inky, and it took a number of units to achieve this effect since the wall was quite big." Far right: Director of photography Peter Suschitzky, BSC and the first unit shot actor Pierce Brosnan and body part elements (right) for an oddly romantic interlude aboard the Martian ship.



Joyce (*Independence Day*, *Batman Forever*) and shot by Dave Stump (*Executive Decision*, *Batman Forever*), was a 40' x 50' forced-perspective tabletop miniature with 6' diameter craters closest to camera, and 9" craters at the horizon. "Mars is quite bizarre-looking and very red," Fink reveals. "It's covered with huge rock pillars like you'd find in Monument Valley, and giant, skinny spikes."

A 900-frame-long motion-control crane up and tilt move was shot on the scaled-down landscape, then repeated for matte and beauty passes. Finally, the CG irises animating open, and dozens of CG saucers flying into a starry CG sky, were tracked into the miniature background.

The next eight or nine cuts, ranging from 200 to 500 frames each, show hundreds of saucers flying toward earth, climaxing in a huge pan/crane/dolly shot in outer space as they reach their destination. (See cover of this issue.) WDS also handled shots of the saucers landing in the Nevada desert for a tentative, "friendly" meeting with mankind. "Those turned out to be incredibly difficult," Fink laments. "It's not a unique situation, but when we filmed the plates in the desert it was alternately sunny and raining, so the color of the earth changed. However, since the saucers reflect the earth, we had to create many different environment masks — one for practically every shot — to reflect into the saucers."

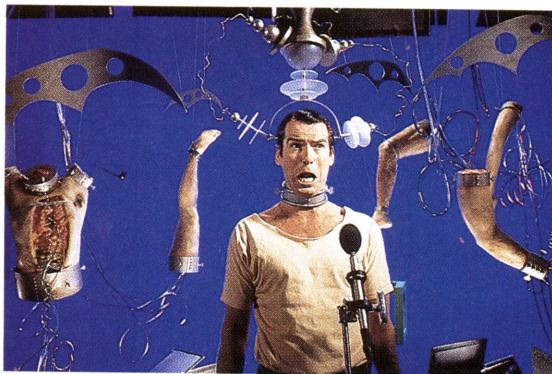
Complicating matters further was the fact that the Martians in these shots were created at ILM, which meant that background plates and animation elements were being passed back and forth. ILM would send digital frames of background plates, with their CG Martians going in and out of empty space, to WDS, where Fink's animators would match their saucers into those shots. Conversely, WDS also delivered CG saucers, which were composited into shots with Martians at ILM.

Meanwhile, Jim Mitchell and his ILM team were struggling to bring the extraterrestrial stars of *Mars Attacks!* to life. Says Mitchell, "We treated them the same way Tim handled Jack Nicholson and Glenn Close. I don't see this so much as an effects film as an animated character film."

The beautiful stop-motion puppets built by McKinnon and Saunders served as guides for ILM's 3-D modelers. Once the characters were re-created on Silicon Graphics workstations, ILM's animators began tests to determine how the Martians would move. "Tim's idea was they were very reptilian," Mitchell recalls. "He had us make them very deadpan, and that's where the humor comes from: they're kind of oblivious to

everyone except themselves."

In the film, there are two types of Martians: those who command and those who serve. The grunts, or soldiers, appear nude aboard their spaceship, but wear green corrugated suits with glass helmets on Earth, breathing nitrogen from tanks on their backs and moving in quick, lizard-like motions. "The grunts can move very quickly, but stay very still until they have a burst of motion to kill people," describes Ellen Poon, conjuring the image of a rattlesnake striking. The Martian Leader and Ambassador are physically identical to the grunts, but wear robes and capes to indicate rank.



As in the vintage *Mars Attacks!* trading cards, these bug-eyed fiends land on Earth with no other purpose than to blow humans away. Animation supervisor Dave Andrews and his crew were only too eager to help the Martians with their nefarious activities.

Following WDS-created shot of Martians "bowling over" the massive statues on Easter Island with fireballs, there is a cut to the gleeful response of the Martian Leader aboard his command saucer. To animate a shot in which the Leader low-fives a grunt after witnessing the Easter Island strike on a monitor, Andrews employed the "posed pose" (or keyframe) animation technique in Softimage, beginning with the two aliens crouching in anticipation. "Then I posed the Martians fifteen frames later with their arms over their heads in jubilation," Andrews explains. "I keyframed all of these poses and blocked the timing: the leader looks at the grunt who's ready to receive the slap, he anticipates, the

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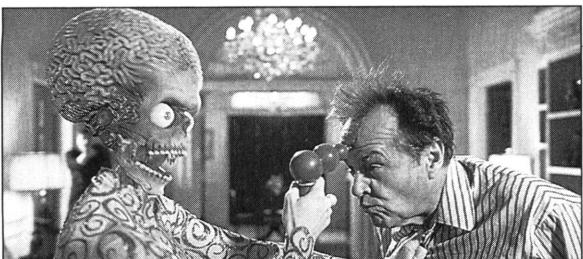
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The President at the mercy of the Martian spy. Careful blends of CG and live action heighten the film's realism. Says mechanical effects supervisor Michael Lantieri, "I don't think I've ever been involved in anything on this level, even Roger Rabbit." Notes Poon on creating Martian facial anatomy, "The gills hanging off their cheekbones flutter whenever they're excited. They were animated in Softimage, then tracked to the chains which drive the gills on the Martian's head model, so they followed the head around. We only got to see the heads and gills together in Cari, because the gills needed high-res geometry before they showed up."

smack happens, and you see the recoil from the smack in both characters. It's like creating the individual panels of a comic strip."

After the keyframes were set, Andrews' animators used an improved version of ILM's Caricature (Cari for short) software — developed to handle Draco the dragon's complex lip-sync animation in *Dragonheart* — to manipulate the more subtle Martian body and facial movements. Cari enabled the animators to work with lit, quick-rendered versions of the Martians, as opposed to crude wireframe figures, so they could actually see their animation updated from frame to frame on their monitors. "We also used Cari for the Martians' facial animation, which was minimal since Tim liked them to be deadpan," Andrews adds.

But not all of ILM's effects were achieved in the computer. A $\frac{1}{4}$ -scale model of the Martian spaceship interior, a set for the original stop-motion puppets, was partially built before Burton decided to use CG. ILM opted to finish the model, working closely with John Dexter and the *Mars Attacks!* art department, then shoot it as background plates for their CG characters. The script called for two distinctive-looking contiguous areas, the Control Room and an ominous Operating Room, but the miniature, with its circular design, grated floor and silver-domed roof, only measured 18' across and 11' tall. Consequently, ILM planned to dress the Control Room first, shoot, then completely redress the interior, using only the same exterior wall, for the Operating Room.

Making a miniature spaceship interior hold up on screen for extensive sequences, however, was a tall order, admits ILM effects cinematographer Pat Sweeney (*The Nightmare Before*

Christmas, The Indian in the Cupboard), especially since Burton had decided against using smoke to diffuse the environment. He explains, "I just used a slight amount of diffusion on the lens. That put pressure on our lighting to create depth and scale. But the fun part was getting into creating set dressing and props — the spaceship interiors are some of the more dramatic-looking scenes in the film."

Beyond physically altering the characteristics of each set, Sweeney tried to contrast the lighting between both rooms. The Operating Room was dark and mysterious, and its specimens were lit with colored lights. The Control Room was brighter and more upbeat. "There was an inner circle and an outer circle of grating throughout the floor structure of the Control Room, so I shot torch-like yellow light through the outer grating and made the inner circle a hotter yellow color," Sweeney reveals. "In the Operating Room, I used a bluer light, so that room was played darker. Having light coming up from underneath gave both areas a lot more depth by suggesting that there were more floors below."

Sweeney chose Kodak's 5248 stock for its finer grain, shooting with custom-designed low-profile VistaVision cameras suspended from large crane arms. The circular set was raised 6' off the floor on a wooden platform and divided into four pie-shapes (enabling Sweeney's crew to remove a quarter or half the set to get the camera into position), but the camera moves were tricky to plan since they inevitably followed the Martians.

Since Sweeney also saw *Mars Attacks!* as a film about these power-mad aliens, he, gaffer Mike Olague and assistant Kate O'Neill, were determined to shoot the miniature set as he would a real full-scale location: in a single pass. While most motion-control shots are executed in multiple passes, Sweeney felt that shooting in one pass would lend to the naturalism of the shots. "That meant balancing practical internal lights on props with our external lighting and creature animation," he says.

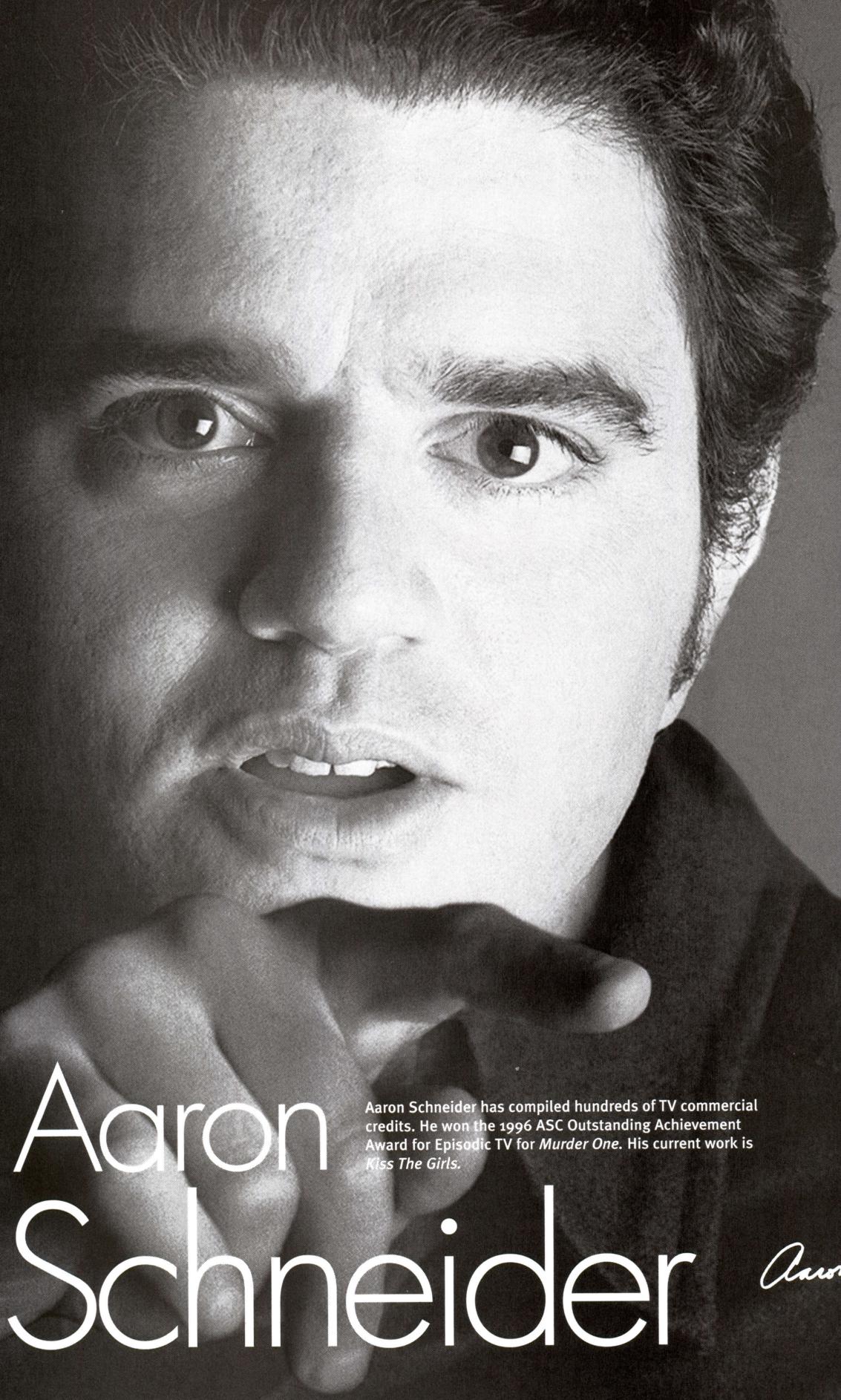
Beyond compositing their CG Martians into these miniature interiors, ILM went one step further by placing actors Pierce Brosnan and Sarah Jessica Parker into the scene. After encountering the Martians, the overly curious Professor Kessler (Brosnan) is dismembered and his body parts suspended in the air by Martian "hangers." However, his head later enjoys a flirtatious encounter in the Operating Room with MTV-style reporter Nathalie Lake (Parker), whose own head now resides atop her pet chihuahua as the result of a bizarre Martian experiment.

Sweeney worked with live-action cinematographer Peter Suschitzky, BSC to shoot Brosnan and Parker against bluescreen, along with full-sized prop body parts and a human heart pumping green and red blood through tubes. In an audacious move, Burton asked ILM to shoot both actors together as they exchanged dialogue. "Tim felt we should shoot the actors together to get the interaction between them," confirms Jim Mitchell. "We just shot them both standing against blue, knowing that we would later extract Sarah's head and move it around onto the chihuahua, which was to be standing on a nearby table. We were concerned about eyelines, but the table was approximately her height, so we just filmed them next to each other with Sarah looking right at Pierce. That was very effective."

While ILM's animators merely had to extract Brosnan's head from the bluescreen shots and track a CG stump to his neck, attaching Parker's head to a CG dog's body was quite difficult. To make the blend, ILM's animators contoured Parker's neck down to chihuahua-size, as if the skin were being pulled taut, then flared the dog's neck up; their necks met in the middle. Explains Dave Andrews, "Sarah's head was a 2-D bluescreen element that we had to blend onto a computer graphics neck-patch, then texture map and paint to match our 3-D chihuahua's neck. We then tailor-made our chihuahua animation so that all of the things her head does motivates its body movements, and vice-versa." ♦

ON

F I L M



Aaron Schneider

Aaron Schneider has compiled hundreds of TV commercial credits. He won the 1996 ASC Outstanding Achievement Award for Episodic TV for *Murder One*. His current work is *Kiss The Girls*.

"Cinematography is a mixture of science and art. The tools and technology make up the science. The art comes from the sum total of what makes a person unique as expressed with that technology. I was fortunate to work with (director) Charlie Haid on my first TV show. He defined the style and character of *Murder One* and gave me the freedom to interpret it photographically. We used body language, meaningful gestures, significant objects and strong composition to tell the story. There was a concept that we jokingly called 'the avoidance of light.' I saturated myself with this philosophy and let it influence my work. But with all the research and preparation that goes into planning a film, I don't discover the look until the moment of photography. I want the light to be truthful. Only the genesis of a scene can inspire that. When you think about it, light is the sole means of revealing information to an audience. But darkness can be just as important. You can put the audience on the edge of their seats by concealing information in the shadows. Their imagination can be much more powerful than anything I light. When I finished my work on *Murder One*, a friend was shooting a short film on a \$3,000 budget. I was his gaffer. It was as joyous a process as shooting a big budget movie."

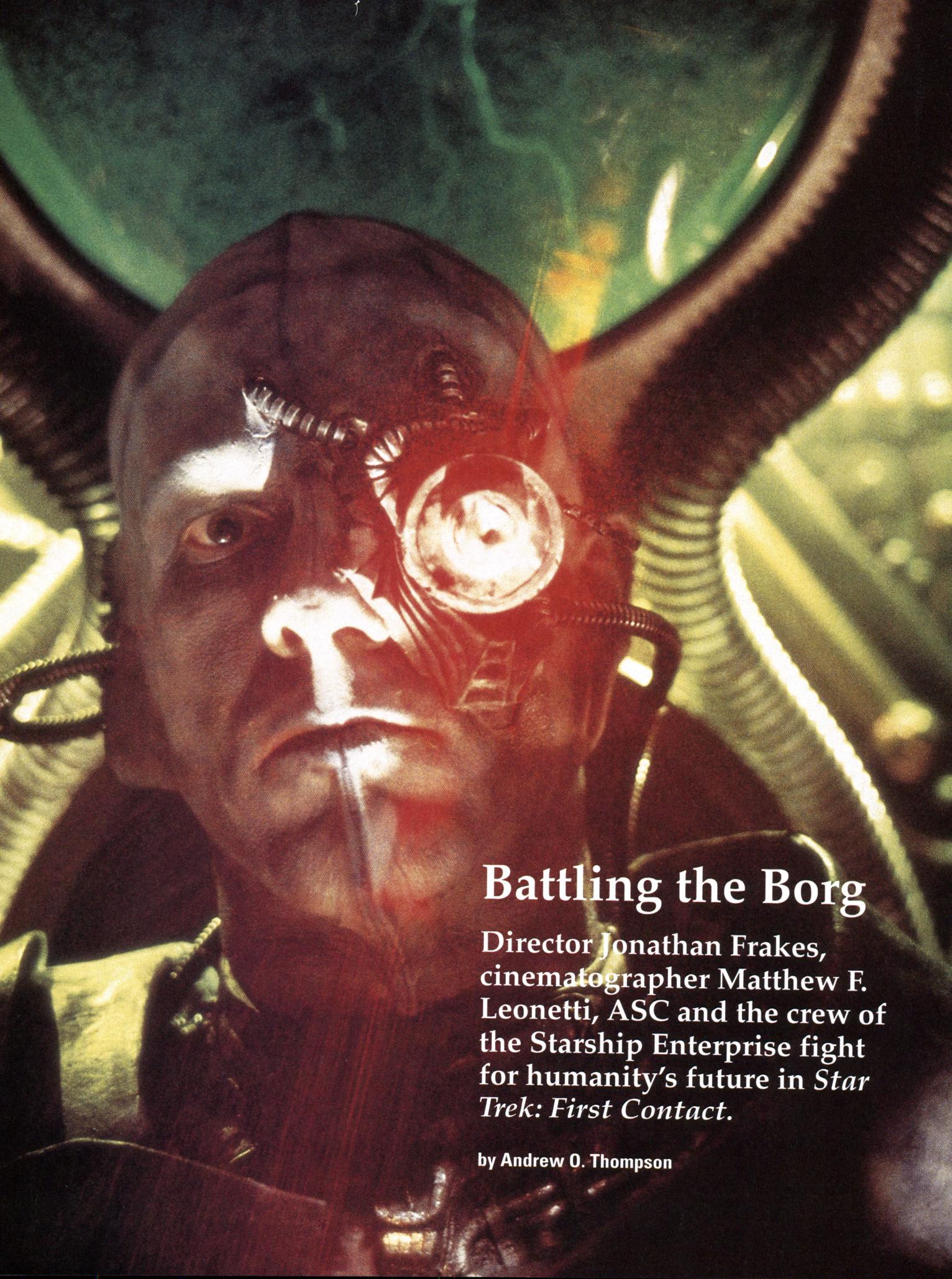
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Battling the Borg

Director Jonathan Frakes, cinematographer Matthew F. Leonetti, ASC and the crew of the Starship Enterprise fight for humanity's future in *Star Trek: First Contact*.

by Andrew O. Thompson

Opposite page: *The eye of the beholder. A Borg drone scans its surroundings in search of hapless officers of the USS Enterprise-E to assimilate into a more mechanized mode of being.*

This page top: *Aboard the bridge of the new Enterprise, Captain Picard (Patrick Stewart), First Officer Riker (Jonathan Frakes), Commander Data (Brent Spiner), Lt. Cmdr. Worf (Michael Dorn), and helmsman Lt. Hawk (Neal McDonough) prepare to boldly go to 21st century Earth to brawl with the Borg collective.*

Center: Director Frakes blocks out an exterior shot while under the watchful eye of cinematographer Matthew F. Leonetti (in far left corner).

It's a mid-June afternoon inside Paramount's cavernous Stage 14, and a showdown is about to ensue in the Engineering Room of the recently raided U.S.S. Enterprise-E. The cybernetic Borg have secured this section of the newly commissioned starship and are slowly assimilating it to suit their way of life. An acrid haze of artificial smoke fills the air; unruly ganglia of corrugated metallic tubing hang listlessly from the ceiling; in place of the instrument panels' familiar Federation markings beam bright, lime-green Borg insignia. Stationed ominously along the circular rear wall are two levels' worth of dormant Borg drones awaiting new instructions as they suck energy out of the Enterprise's engines.

Directly in front of the pulsating matter/anti-matter intermix cylinder lies Commander Data (Brent Spiner), outstretched and anchored face-down to a rotating hydraulic table. The platform emits a low purring hum, and executes a reverse 180-degree turn as the android stares upwards and struggles in vain with his restraints. Resigned to his fate, Data awaits his tormentor, the svelte Borg Queen (played by *Barfly*'s Alice Krige). Her mechanized majesty will later tempt the artificial officer with the ultimate choice: betrayal of his fellow crew members in exchange for fulfilling his all-pervasive wish to become human.

Due to the misty atmosphere and the strategically spaced spotlights, the set is somewhat humid. Yet Spiner, a good-natured sort, doesn't seem to mind the fact that he is covered in his signature golden makeup and is strapped to the table by two thick belts across his torso and the platform's upper rib of faux metal. Between takes, he initiates chipper conversation with the crew, and even offers up a hilarious, dead-on impersonation of Marlon Brando.

Once the rostrum is repositioned and the set cleared, the levity subsides and a familiar voice

booms, "Brento, action!" As the take commences, Spiner's *Star Trek: The Next Generation* co-star Jonathan Frakes (a.k.a. Commander William T. Riker) sits off to the side of the cylindrical chamber, staring intently at the images playing out on a monochrome monitor.

Finnerman, A.C. Francis, Howard Anderson and Linwood Dunn throughout its three-season run.

As the eighth *Trek* feature film (and the first to exclusively feature the *Next Generation* cast) *First Contact* is also the most expensive; its \$47 million price tag bests



Oddly, the Enterprise's first officer is oblivious to the menacing pair of Borg minions hovering over his head. But then again, Frakes' current concerns are more pressing, since he's embodying his on-screen title of "Number One" both behind and before the camera as the director of *First Contact*.

The respective crews of the Enterprise have faced some rather nefarious foes, but none as hell-bent upon interstellar conquest as the Borg. First introduced in the *Next Generation* episode "Q Who," this xenophobic race is the imposing nemesis in a film that marks the 30th anniversary of *Star Trek* creator Gene Roddenberry's original series, which was brought to the small screen with the help of ASC members Gerald Perry

even the budget of the first film in the series, *Star Trek — The Motion Picture* (see AC Feb. '80).

Revolving around the staple *Trek* plot device of time travel, *First Contact* opens with the Borg engaged in its ongoing campaign against Starfleet. Having reached a standoff, the Borg venture back to early 21st-century Earth to prevent scientist Zefram Cochrane (a character from the original *Trek* series' episode "Metamorphosis," played in the film by *Babe*'s James Cromwell) from developing warp-drive technology. To do so, the Borg must thwart Cochrane's launch of his experimental ship, the Phoenix, as this landmark flight caught the attention of a Vulcan scout ship which, in turn, followed the craft to Earth. This close encounter pulled humanity out of its painful post-World War III reconstruction period, and prompted the formation of the United Federation of Planets.

To safeguard the future, Captain Jean-Luc Picard (Patrick Stewart) shirks direct orders from Starfleet Command and takes the streamlined, Sovereign-class U.S.S. Enterprise-E into the past to ensure that Earth's timeline follows its correct course. (As die-hard fans will

surmise, this ship is a replacement for the D-series Enterprise which met her demise in the previous film, *Generations*.)

In assuming the directing chair, Frakes follows in the footsteps of veteran *Trek* stars Leonard Nimoy (*The Search for Spock*, covered in AC Aug./Sept. '84; *The Voyage Home*, AC Dec. '86) and William Shatner (*The Final Frontier*, AC July '89). Though this is Frakes' first feature, the actor is by no means a neophyte, having helmed numerous episodes of *The Next Generation* and its spin-off series *Deep Space Nine* and *Voyager*. Says the director, "It seemed as a safe a place as any to get my [directorial] feet wet, having worked with all of the actors before and being familiar with the genre and the ship — the whole *Star Trek* gestalt, as it were."

The cinematic mission also gave Frakes the opportunity to stretch his directing chops; an episode of the series has seven days of preparation and a seven-day shooting schedule, whereas on *First Contact*, Frakes had a 10-week preparation period and 12 weeks' worth of filming (from April to July). The director also got to expand his visual canvas from that of

the 1.33:1 TV screen to the 2.35:1 anamorphic format.

In keeping with his philosophy to "always steal from the best," Frakes' directorial aesthetic for *First Contact* drew from the work of such action-genre filmmakers as Ridley Scott, John McTiernan, Phillip Noyce and James Cameron. To visualize this synthesis, he brought aboard director of photography Matthew F. Leonetti, ASC out of admiration for his work on *Poltergeist*, *Another 48 HRS* and *Strange Days* (AC Nov. '95). Frakes soon found that the cinematographer's personality meshed well with his own, remarking, "I loved his sense of style, his use of color, and the way he moved the camera. But most of all, after having met him I could tell that he was the kind of director of photography I needed on my first feature because of his experience, and his knowing demeanor. We're a great balance — I'm hyper and he's calm."

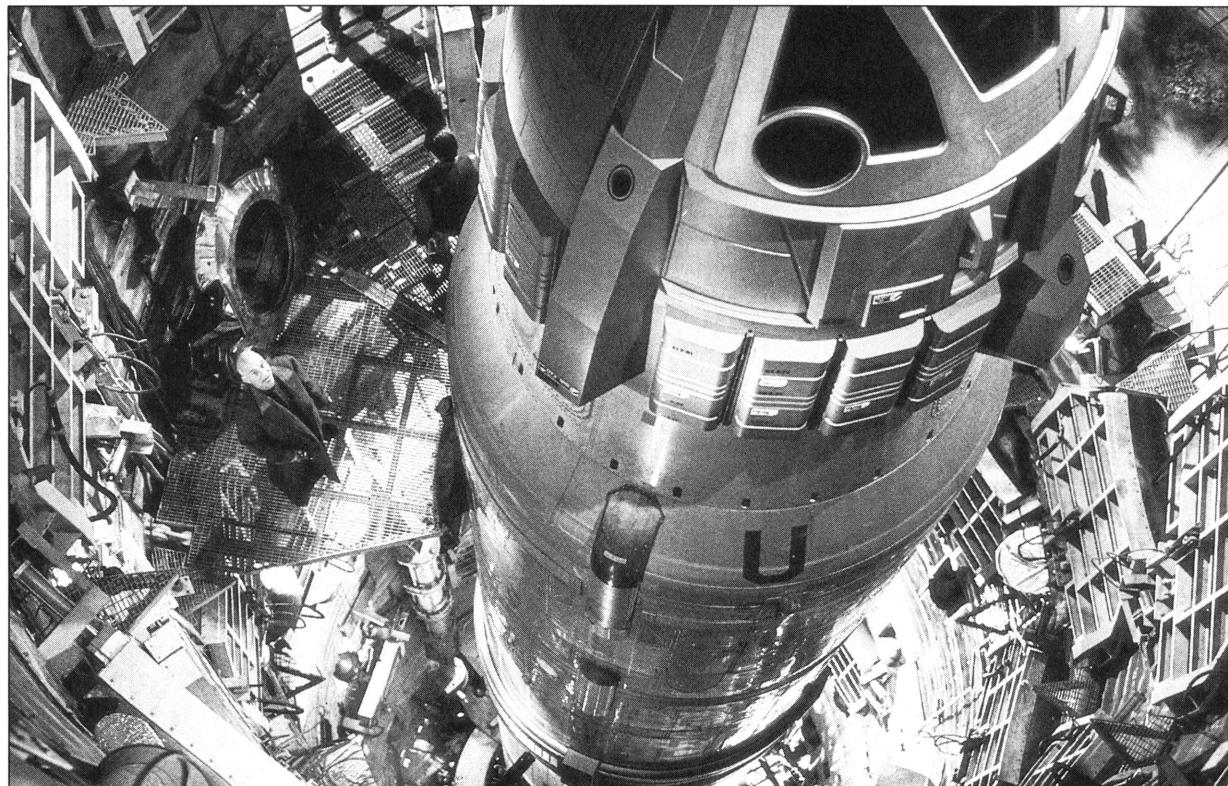
A working cinematographer for nearly 25 years, Leonetti's first contact with the film industry occurred as a youth while he was working at his father Frank's production equipment rental house. In the mid-Sixties, the Los Angeles

native became a camera assistant, and then proceeded to shoot numerous commercials, MOWs, and pilots throughout the Seventies. Leonetti earned his first feature credit as director of photography in 1977 on Jonathan Kaplan's comedy *Mr. Billion*; his other major feature credits include *Breaking Away*, *Eye-witness*, *Jagged Edge*, *Weird Science*, *Extreme Prejudice*, *Red Heat*, *Johnny Handsome*, *Dead Again*, *Angels in the Outfield*, *A Low Down Dirty Shame* and *Fled*.

Leonetti confesses to having been unfamiliar with the *Star Trek* mythos when approached by Frakes for *First Contact*. As preparation, he studied the features *The Voyage Home* (shot by Don Peterman, ASC), *The Final Frontier* (Andrew Laszlo, ASC), *The Undiscovered Country* (Hiro Narita, ASC) and the most recent *Trek* adventure, *Generations* (John Alonzo, ASC). The cameraman also observed a few days' worth of filming on *Voyager* and *Deep Space Nine*.

For *First Contact*, Leonetti utilized Kodak's 5298 stock and Panavision cameras and C-series anamorphic lenses — the lightness of which proved beneficial, as Steadicam was used extensively

Picard stares in wonder at the Phoenix, the rudimentary warp-drive craft which takes scientist Zefram Cochrane on his impromptu encounter with a Vulcan scout ship. This ship is actually a disarmed Titan II missile in an Arizona museum silo. Leonetti illuminated the 146-foot-long shaft in green and orange hues (provided by numerous small fixtures) to lend added dimension to the missile.

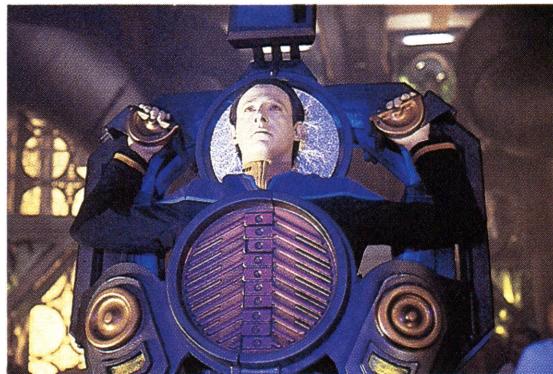


throughout the shoot. His primary focal lengths ran from 50 to 70mm, though exceptions included the distorted point of view from a Borg's eyepiece, spied through a 14mm spherical lens. "For the hand-to-hand combat scenes [between the Borg and Enterprise crew members] we used wide lenses to get in tight," he describes. "That gets you right in there as part of the action as opposed to being a distant viewer watching it. A lot of these fights were also shot handheld, so when the actors moved we could move with them as opposed to [being stuck] with a tripod."

However, Leonetti has a preference for longer lenses and relied on them whenever feasible, explaining, "We wanted that long-lens effect in the hallways of the ship, to stack everything up and make it seem more claustrophobic. But you can't get too far back because we didn't want to make the ship look non-dimensional. If you use long lenses, all you've got is a wall behind you."

Leonetti set a specific illumination scheme for the Enterprise-E's standard operations ambience, Red Alert situations, and predicaments requiring emergency power. "The Enterprise is being invaded by a foreign entity," offers the cameraman, "so it required more dramatic-looking lighting and framing. I was in favor of giving it more 'real' look, and the story lent itself to a dramatic feel and more smoke as the ship was being taken over by the Borg. Anything in the process of being destroyed, naturally, has a moodier look than a place where everybody's going about their normal business."

During scenes depicting normal starship procedures, Leonetti chose to cast crosslighting upon the Starfleet principals. Thus, the traditional muslin ceiling of the Enterprise bridge set was removed, and lighting grids were situated around the sides. The fixtures were



then aimed toward the actors' faces at a 90-degree angle.

During battle sequences, scarlet lights indicate that the Enterprise is on Red Alert. The bridge set itself is lined with window paneling backed by red lights which blink intermittently. Leonetti, however, supplemented by adding "interactive" light. From off stage, red-gelled juniors and 750-watt sources cast flashing rims on parts of the bridge set and the heads of the Enterprise crew.

When an enemy power surge leaves the Enterprise lifeless, the lighting originates only from instrument display panels and the Red Alert signals. Leonetti reduced his fill light so that when the officers venture to different sections of the bridge and other interiors, they would often pass through darker spots supposedly out of the limited range of these sources. Describes the cinematographer, "When the ship's lighting system breaks down, we added the shafts of emergency lights on the bridge, in

the corridors, and in the engine room. They were different colors — red, white or sometimes green — arbitrarily done with a sense of 'organized disorganization.' We also used tiny 30- and 50-watt Par lights designed just to throw shafts. If you tried to light something with them you'd only get a surface pool about one foot in diameter."

Once the Borg breach the Enterprise's defenses and embark upon their assimilation process, Leonetti had to reconfigure the lighting inside the starship to reflect the designs of its new masters. He explains, "When the ship gets Borgified, everything is changed into more of a squared-off, robotic look with sharp edges but rounded images, so we lit the corridor walls from underneath to give them some serious shape. The corridors were only six and a half to seven feet high and their roofs were attached; if you got the camera low at all, you'd see the ceiling, so every fixture had to be hidden. We used a lot of fluorescents, gimmick lights [50-, 100- and 150-watt globes backed with tinfoil], and box lights we built with foamcore. It was impossible to use regular lighting because you'd see the fixtures, especially in anamorphic, where you see 30 percent more from left to right than you would in 1.85."

The opening sequence of *First Contact* entails a nightmare in which Picard recalls the traumatic Borg assimilation he experienced in the two-part *Next Generation* episode "The Best of Both Worlds."

Left: Adorned in 21st century couture, Riker, Chief Engineer Geordi LaForge (LeVar Burton) and Counselor Deanna Troi (Marina Sirtis) visit scientist Zefrem Cochrane (James Cromwell) on the grounds of his makeshift laboratory in Resurrection City, Montana (shot in California's Angeles National Forest). Leonetti backlit the foliage in blue for added depth, and to provide the illusion that a self-supporting lighting source lay within the forest. Center: Synthetic sabotage. Having been snared by invading Borg, a trapped Data bides his time in the Enterprise's Engineering Room anticipating his interrogation by the Borg Queen.

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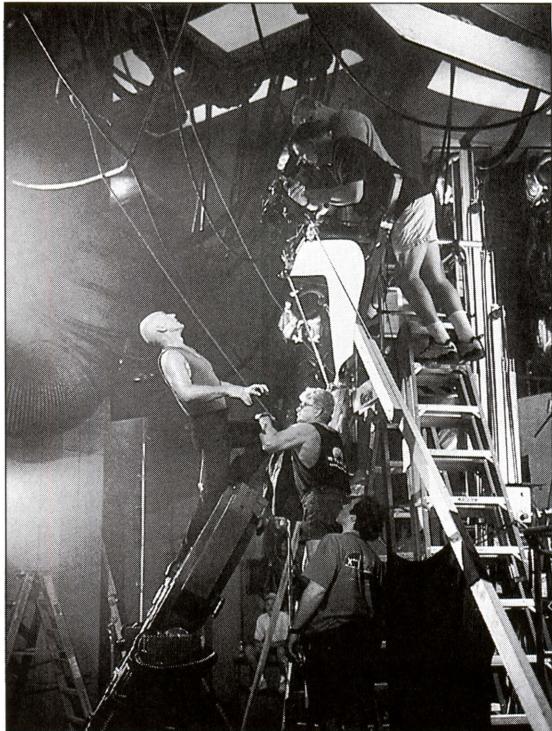
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Setting up an in-camera effects shot involving Picard.

One shot starts inside the iris of Picard's eyeball, and, with an extended pullback, reveals the captain aboard a labyrinthine, cube-shaped Borg ship. The shot continues to pull back and finally dissolves into the exterior of the immense craft as it cruises through deep space. This particularly tricky setup was filmed as three separate elements later melded together with digital effects. Notes Leonetti of the initial close-up on Picard's face, "We started real tight on his eye and pulled back about 25 feet, so we had to pull the key light up to 1,000 footcandles so that we could get enough depth to keep his eye sharp. We used a 50mm lens because its minimum focus is about two feet and we could get an eyebrow-to-nose size that would make it easier for the effects team to dissolve from a extremely tight shot of his eyeball to our pullback."

In order to achieve a fluid match with the CG painting of Picard's iris (executed by Syd Dutton's Illusion Arts), the reverse dolly move had to be as smooth as possible. The surface of the stage, however, proved much too uneven. To remedy this, the 135-foot-long dolly track had to be raised some six to eight inches above the stage floor. The low platform was fashioned out of 80 eight-foot-long 4 x 4s, layered with 140 pieces of double-thick birch plywood (chosen for its smooth veneer). The cutaway interior set of the Borg ship rested some 12 feet above ground level.

Continues Leonetti, "We then put Patrick inside the set, which was about 90 to 100 feet wide and 25 feet high. After making the shot as tightly framed as we could possibly get it, with a remote

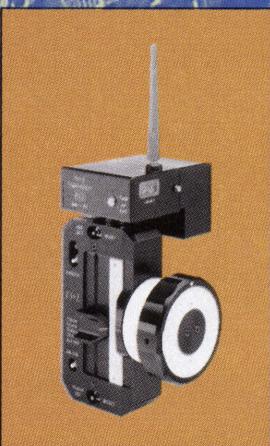


crane and camera on a hybrid dolly, we pulled back 125 feet to reveal our set, the rest of which would be created digitally."

In keeping with the practice of the four prior *Trek* features, a few of *First Contact's* futuristic vistas were simulated on modern locations. The shooting schedule commenced with four days of filming in Green Valley, Arizona at the Titan Missile Museum; a disarmed Titan II doubled as Cochrane's Phoenix rocket. The missile's silo had a diameter of 25 feet, was lined with channel aluminum behind 15 foot thick concrete walls, and ran 146 feet deep; the missile itself was 130 feet in height. Jutting out from the silo's inner walls were trapezoidal-shaped scaffolding platforms on hinges (with an area of approximately 21 feet) that could be lowered or raised to allow for free passage of the missile if fired. Each platform was located eight feet away from the missile. There were 10 levels' worth of scaffolding, with each floor some 12 feet apart from the next.

Rigging the cramped confines of what Leonetti describes as "a cigar inside of a cylinder" proved to be one of the most difficult tasks the cinematographer has ever overseen. Leonetti, his long-

focus from afar



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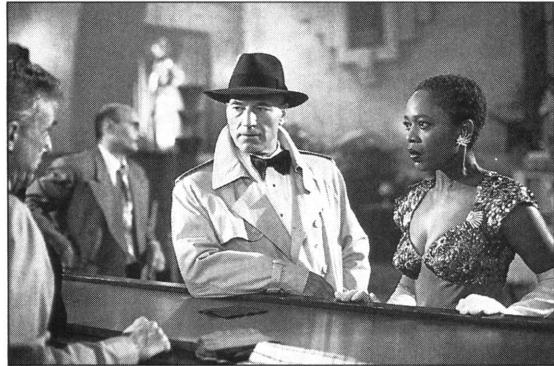
Picard and Cochrane's aide, Lily Sloane (Alfre Woodard), out for a Forties-style night-on-the-town in a swank nightclub conceived in the Enterprise's holodeck.

time gaffer Pat Blymer, and Frakes blocked out the camera moves before devising a blueprint for the silo's lighting. Its unyielding design required the grips and gaffers to rig it while shimmying down the shaft, either on bosun's chairs or climbing cords. Notes grip Lloyd Barcroft, "We had to scale these 150-foot walls and then hang the lights. There were safety officers from the police department there, and we put on belts with tag lines attached to the top of the silo.

Personally, I don't like having a tag on me because if they pull the wrong way, they'll pull you right off the wall. It's just like rock climbing: some guys like to free-grip and some don't."

Two particular shots of the silo — one from the missile's nose downward, and the other from its engines upward — necessitated that all of the lighting fixtures be inconspicuous. This was also a consideration for a shot of Data plunging down the length of the shaft to rescue a plummeting technician from an abrupt encounter with the silo's floor; Leonetti had to shoot two empty plates of the shaft (along Data's downward trajectory) that were later composited in post with an image of actor Spiner performing the drop in front of a bluescreen. With these shots in mind, there was no option but to light the silo with small units: inkies, babies, tweenies, additional gimmick lights, reflector floods on sockets, 100-watt bulbs and 60-watt mini-globes.

To add greater dimension to the Titan II, and give it a futuristic appearance, Leonetti chose complimentary colors to offset the missile's metallic surface. He explains, "Its casing is aluminum-like sheet metal, so we added green and orange to it in different places. This created a 3-D effect, as different densities and different-colored



gels made it look longer than it really was. You don't light it fully, you let it drop off at places. Then, if you put a 30mm lens at the nose of the missile and look straight down, it seems 250 feet long."

Exteriors of the Phoenix's launch tube and the surrounding encampment of Resurrection City, set in the ravaged environs of 21st-century Montana (circa 2063), were captured on Kodak's 5248 stock at the Charlton Flats campground in Southern California's Angeles National Forest. As the greenish hues of foliage tend to consume an inordinate amount of light, providing night-for-night illumination for the adjoining forest was no simple task. A 600' by 300' foot section of trees were lit with eight 18Ks, 15 4Ks, and multiple 2,500-watt Par HMIs. Leonetti bathed this area in blue for additional depth and to indicate that the makeshift community had a self-sufficient source of illumination. Says the cinematographer, "It was like a old mining camp from 1850s California, but the structure of the buildings had a more high-tech look. We put a lot of campfires in there that people would be cooking on, and used that as source lighting for the sets at night, along with master lights (boosted 1K bulbs), 407s, and inkies. For a wide shot, we would place some HMIs up on parallels and backlit the town. Then the set dressers put in some temporary-looking posts, like modern flood lights, so we could also light part of the set with those."

Amidst all of *First Contact's* 21st- and 23rd-century vistas, a sequence in the Enterprise's holodeck (an interactive, virtual reality recreation area) allowed Leonetti to indulge his fondness for the lighting



A T R A D I T I O N O F E X C E L L E N C E



Flanked by Picard and Data, the ever-earnest Dr. Beverly Crusher (Gates McFadden) scans for survivors while scouting Cochrane's underground control center, a recent target of Borg bombardment.

of such classic black-and-white films as *Casablanca* (shot by Arthur Edeson, ASC). In this scene, Picard assumes the guise of his alter-ego, the tough-talking gumshoe Dixon Hill. Accompanied by Cochrane's spirited assistant, Lily Sloane (Alfre Woodard), he cavorts in a Forties-era nightclub, complete with big band accompaniment.

To create the sequence, the production spent three days in the art-deco Fred Harvey Restaurant in downtown Los Angeles' Union Station. Finding the site impractical for the 10Ks and 20Ks he initially wanted to use, Leonetti opted to place dimmer-controlled master lights near the ceiling. He also took advantage of a large circular window, backing it with diffusion material and then shining multiple 20Ks through it. Explains Leonetti further, "To give [the nightclub] a black-and-white look, but be as dark as possible without warming it up, we used straight light — straight in the sense that there were no colors. I like creating separation with lighting as opposed to using color. You can't



always rely on color because the actor might start to melt into the background. What if the camera moves around and the background changes from a light orange to black, and the actor has black hair? With just a little bit of backlight separation, it pops him back out. That's one way of keeping the audience's eye focused on the actors as opposed to the set."

The cinematographer had

hoped to shoot the scene in black-and-white, but test footage was deemed "too experimental" by executives.

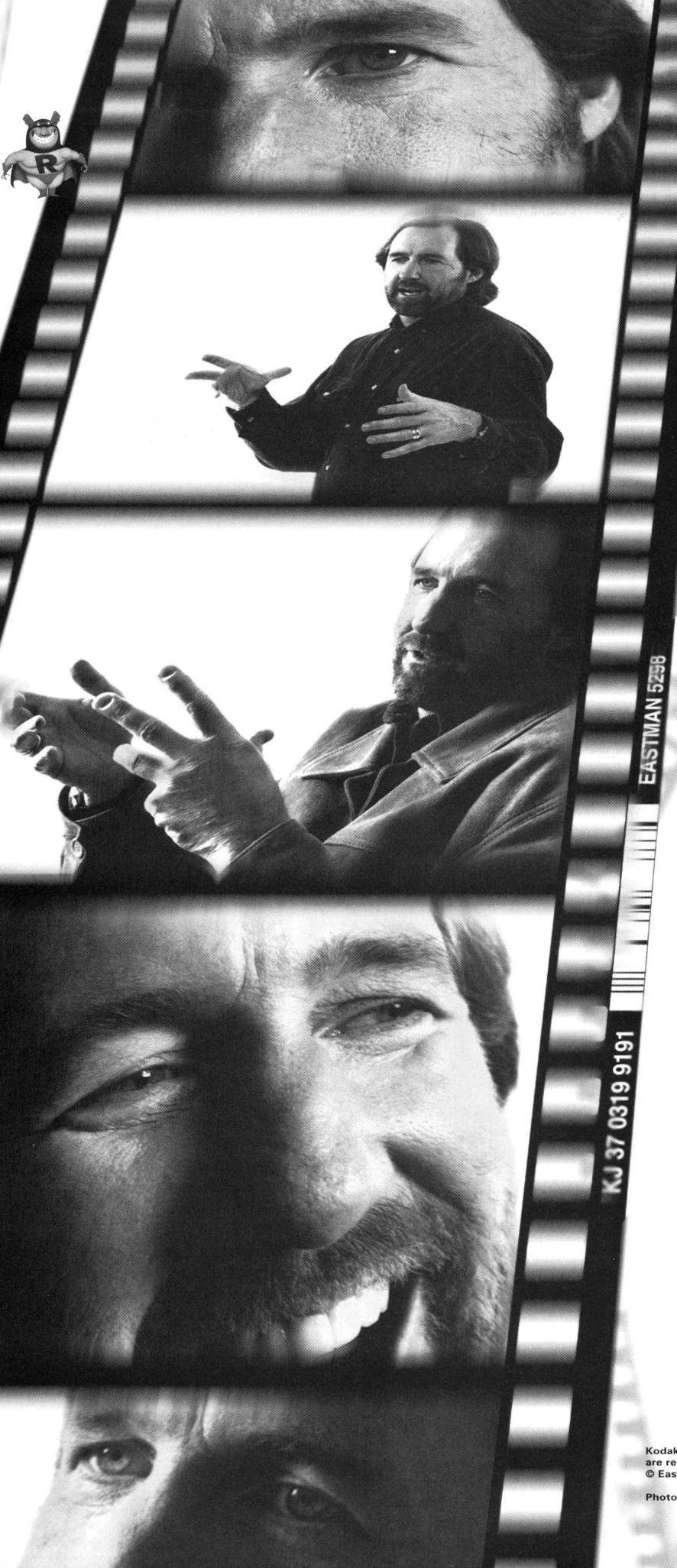
Having completed his first tour of duty aboard the U.S.S. Enterprise, Leonetti is turning his eye to action fare as cinematographer on *Mortal Kombat: Annihilation*, currently shooting in England and being directed by his brother, John Leonetti. ♦

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JEFF ZWART ON FILM

"Every spot is a radically different challenge. The camera needs to be a participant if you want the audience to share the experience. You need to be in the right places in the right light. But it's not always predictable."

It always comes down to trust. You have to trust your crew, your camera gear, and your film. We choose the film designed for the light we want to shoot in. A lot of times, it's beauty light late or early in the day.

Other times, we need the latitude to cover a wide range of contrast or we want a certain texture. There is a lot of talk about digital postproduction, but it's the shooting that's crucial. The image we create decides how people feel about the client and the product."

Profile: Jeff Zwart is a graduate of Art Center College of Design. During the late '80's, he was a red-hot print ad photographer for Nissan, Porsche, and BMW. Driving a Porsche, he won his class in the famed Pike's Peak Hill Climb in 1994 and 1995. Jeff is now a director-cinematographer for @radical.media. His credits include a who's who of automotive companies, as well as Reebok and No Fear.

For more information on Jeff Zwart or Kodak motion picture film e-mail us at <http://www.kodak.com>

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Photography: Douglas Kirkland



Make Every Second Count

With barely five months to envision an entire universe for *Star Trek: First Contact*, the effects artists of Industrial Light & Magic often wished they could accompany the crew of the Starship Enterprise on their journey into the past. Says Jeff Olson, a former modelshop supervisor who made the quantum leap into his first foray as a visual effects producer on the eighth *Trek* film, "We were running 35 shots at a time and working around the clock to get this movie done. The big challenges were organizational, getting all the different types of effects

overall structure. The only catch in the design process for the new Federation flagship was that it couldn't be conceptualized all at once. Paramount's Rick Sternbach made blueprints off of Eaves' concept drawings, progressively sending top, bottom and side views to the modelmakers as studio executives approved them. But Knoll and company didn't mind the pressure on the already tight deadline caused by delaying the Enterprise-E's effects shots, as it gave them the opportunity to build an Enterprise from the ground up (the D used in *Generations* was a repainted 6'

In addition to Knoll's trademark "specular highlights" paintjob (the starship's panels were alternately painted matte and glossy, creating texture under raking rimlight), the effects supervisor wanted to be able to see through the windows into the ship. So he had ILM's modelmakers mount slides of the sets behind tiny laser-cut windowframes. When the camera tracks past the ship, audiences will see a parallax shift as if the rooms behind the window are dimensional. Explains Knoll, "I think of the Enterprise, with all of its windows, as being like an office



Where No *Trek* Has Gone Before

ILM heads up effects effort on latest film, which offers an array of new and exciting visual imagery.

by Ron Magid

The Enterprise-E lays down a pattern of Quantum torpedoes as it engages the Borg Cube. The ship's streamlined design made shooting the model easier, and as effects cinematographer Marty Rosenberg notes, "The new Enterprise is very sleek; it's low and flat — just a beautiful design."

happening simultaneously in a very compressed schedule."

Keeping this latest cinematic voyage on track is veteran visual effects supervisor John Knoll, who recently helmed ILM's work on *Mission: Impossible* and portions of the touch-up for the upcoming re-release of the *Star Wars* trilogy. Knoll is also somewhat of a *Trek* veteran, having animated the Enterprise-D's sling-shot into warp drive in *The Next Generation's* 1987 pilot episode "Encounter at Farpoint." He then re-created that effect in computer-generated form for *Star Trek: Generations*. Knoll's plans for the latest film, starting with the Enterprise herself, were no less ambitious, but he had to obey Paramount's prime directive that the ships' movements and lighting remain within familiar parameters.

In designing the fresh-off-the-lot Enterprise-E, Paramount's resident *Trek* designer, John Eaves, rotated the D's saucer section some 90 degrees and streamlined its

model built for *TNG's* pilot.

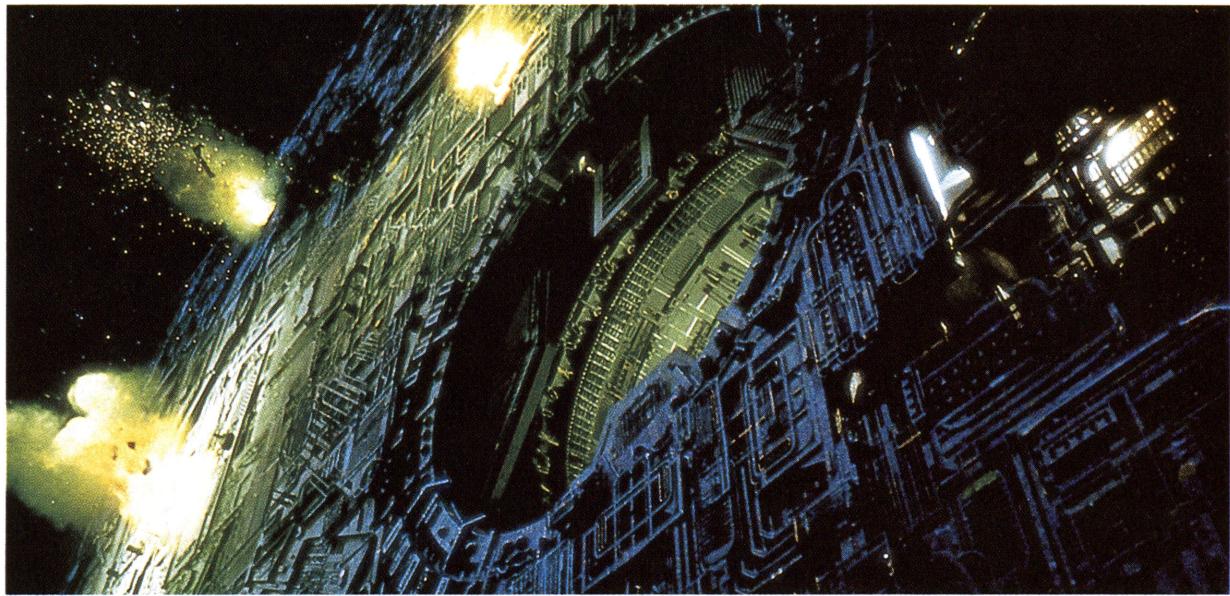
Working from Sternbach's blueprints and a 30" prototype mockup of the ship built by Eaves, modelshop supervisor John Goodson and his crew fabricated a 10 1/2' miniature over a five-month period. Patterns were carved out of wood (some were made out of foam covered with fiberglass and then detailed), then cast and assembled over a 1/2" aluminum plate armature designed and built by Brian Dewey to create the Enterprise-E miniature.

For Goodson, a modelshop supervisor on *Generations* whose first model kit — completed when he was five — was the Enterprise from the original series, this job was a dream come true. Of the redesign, he notes, "By rotating the saucer and eliminating the neck so that [the saucer] transitions right into the belly, and then moving the engines back up on the struts like wings, we made the Enterprise-E look as if it's going fast even when it's just sitting there."

building at night — [the windows aren't just] a bunch of flat-lit, glowy squares, but actual rooms with detail and variations in color and texture."

Most of the effects on *Star Trek: First Contact* were planned using low-resolution, computer-generated animatics — animated storyboards — to establish their length, action and composition, enabling producers Peter Lauritson and Rick Berman, and director Jonathan Frakes, to ascertain how the effects would time out before they were actually shot. Thus, the dramatic introduction of the new Enterprise would be created in reverse order. The CG background (which appears in three shots) was built first; much later, the Enterprise-E was shot motion-control with its movements patterned on those laid out in the animatics.

Sequence supervisor Dennis Turner, whose specialty is creating computer-generated smoky effects and natural phenomena (*Generations' Energy Ribbon*, *The*



Mask's heart-shaped smoke rings), was charged with creating this CG background — a spectacular unexplored nebula, with massive columns of dark matter and starry swirls resembling the M16 nebula photographed by the Hubble Space Telescope.

Reveals Turner, "I used a CG stand-in to plan the sequence. The first shot, in which the Enterprise-E emerges from within the nebula in a long arc, turns towards camera and flies overhead, was very long — 600-plus frames. The nebular columns and other solid dark matter areas were modeled using basic wireframe geometry. To make the columns glow around the edges, I made a surface shader that simulates that lighting dynamic and applied it over the wireframe. I used the particle render we devised for *Twister*'s tornadoes to create the turbulent look of the nebula and the glowing wisps and stars in front of and behind the columns. It's pretty colorful."

Having built the 3-D nebula environment from one angle, Turner exploited the advantages of computer graphics by simply repositioning his virtual camera and rounding out the sequence with other vantage points. All that remained to complete the shots was for the motion-control crew to shoot the Enterprise-E model based on the animatics. Turner then plugged the ship into his CG background and altered its posi-

tions so that both images matched up.

Visual effects cinematographer Marty Rosenberg filmed the opening beauty pass of the sleek Enterprise-E, as well as all of the other miniature effects, explosions and some live-action bluescreen elements. Before joining ILM and working his way up through the camera ranks, Rosenberg began his career shooting effects on *The Right Stuff* for Gary Gutierrez. Most recently, Rosenberg shot *Mission: Impossible*'s spectacular helicopter crash, as well as some of *Generations*' Enterprise-D effects, which gave him a healthy respect for the Enterprise-E. But the redesign presented some photographic challenges. Recalls Rosenberg, "I shot the Enterprise-D with a 35mm lens, but the E has a much longer dish, which started to look a little too wide-angle on that lens. I used a 50mm on a lot of the shots, which helped keep the dish from sticking out too much."

Opines effects supervisor Knoll on shooting the new ship, "[The angle] out in front, looking up at the dish, is a bit of a problem because the warp nacelles stick up above the saucer's edge. You can't see the tips of them from underneath, which makes the silhouette look a little funny. It looks better from above and below and, to some extent, front and back. But if we go way out to a sideview, that's not the ship's most attractive angle,

because it looks so vertically flat and elongated."

The Earth-threatening Borg Cube presented its own photographic challenges, since Knoll insisted upon highly detailed closeup shots that scraped the surface of the gigantic alien vessel. ILM's modelshop layered their 30" model with 5" of molded detail panels and photo-etched brass (laid out by *First Contact*'s art consultant, Bill George of ILM) over a glowing green neon lightbox for internal illumination.

Reflects Knoll, "The idea of having this big ship, three miles square, that was nothing but a junky-looking cube, was very different than what had previously been done on a *Star Trek* film. I wanted it to look bigger and badder, so wherever possible, we were looking up at it. We shot it fairly close with relatively wide lenses, and tried to make it break frame in many shots, as if it's too big to photograph completely. It's hard to do a shot of an office building where you see the whole thing. I also turned the Cube 45 degrees so that one edge of it would come toward the camera like the prow of a ship."

As with all of *First Contact*'s motion-control models, Rosenberg shot the Borg vessels using Kodak 5248, but he also employed harsher light to give the Cube both texture and depth. Offers Rosenberg, "I created this re-

Starfleet scores direct hits against the Borg Cube. Shots such as this were done with a 60" model built with specific areas that could be blown up repeatedly without damaging the miniature.

ally odd, raking three-quarter backlight coming from the right or left side, which I balanced out with nets and a couple of little lights. I wanted it to look scary and mysterious, so it was lit like a point, and we always had the camera dutched to it; we never just had it coming straight at us. The neon core and some small wheat-grain lights on its surface made it more interesting and beautiful, and really helped create scale. We gave it a slow, determined movement; we never see real speed."

Speed is something reserved for the Federation ships intercepting the Borg. While Starfleet has primarily been represented on the big screen by the Enterprise-B (a.k.a. the *Excelsior*), the Reliant from *Trek II*, and the Farragut built by Greg Jein for *Next Generation*, Knoll insisted that *First Contact's* space battle should prove that this armada was bigger than three ships plus the Enterprise. Remarks the effects supervisor, "Starfleet would probably throw everything it could at the Borg, including ships we've never seen before. And since we figured a lot of the background action in the space battle would be done with CG ships that needed to be built from scratch anyway, I realized that there was no reason not to do some new designs."

Alex Jaeger, who lent his skills to *Congo* and *Mission: Impossible* after joining ILM's model shop fresh out of design school last February, was appointed visual effects art director of *First Contact*, and was assigned the task designing four other starships to expand Starfleet. Says Jaeger, "Paramount wanted ships that would quickly read as different from a distance. The Akira class features the traditional saucer section and engine nacelles combined with an offbeat catamaran-style double hull. The Norway class is a Voyager-esque design. Saber class is a smaller Reliant-sized ship whose nacelles trail off the tips of its saucer, which is molded into the fuselage. The final design, Steamrunner class, has twin nacelles trailing off the top of the saucer, which are connected in the back by an engineering section at the deflector dish."

Jaeger's designs were

modeled as 3-D wireframes, realistically painted and textured in the computer, and then put through their paces, along with the Enterprise and Borg Cube miniatures, in the film's dozen *Return of the Jedi*-style space battle shots. The impact of multiple phaser hits, plus the Enterprise's new Quantum torpedoes, eventually decimate the Borg Cube. Individual hits were achieved using a 60" Borg Cube model that had specific areas which could be blown up again and again without damaging the miniature. For the final annihilation explosions, effects cinematographer Rosenberg shot some ten 30" cubes, with lightweight skins packed with explosives, over several nights. The Cubes were suspended from pipes some 60' above Rosenberg's high-speed anamorphic camera, which was on the ground pointing straight up at the exploding models and shooting at 300 fps. Safety glass placed over the lens prevented optical damage, while the camera was protected by a piece of plywood with a hole cut out to accommodate the matte box. Notes Rosenberg with a grin, "At the end of each take, the matte box was maybe 4" deep in plastic! We knew the shot was finished when we couldn't see anything!"

As the Borg Cube explodes, a 5" motion-controlled hatch opens, deploying the time-traveling Borg Sphere. The Sphere model, covered with lots of coarse surface detail and some brass filigree, was 26" in diameter. But as this globular ship was supposed to be much smaller than its craft of origin, it was shot separately and digitally composited to exit the Cube. Once released, the Sphere conveniently generates its own time-travel gateway, the Vortex, the design of which was dictated partially by its actions. Since the Borg Sphere nose-dives toward Earth, Knoll and company opted for a rocket re-entry effect with a bowshock forming in front and then streaming backwards at high-speed. The bowshock had to convey the notion that it was a time-displacement field generated by the Sphere to open a time tunnel lying ahead of it.

Recalls Knoll, "We started

by showing this bowshock forming in front and continuing to grow and expand as the sphere dives down through it. We always show the Vortex from the outside. Like the *Deep Space Nine* wormhole, we see the effect happening around the singularity, but never the singularity itself. We wanted a sense of urgency as the Enterprise-E follows the Sphere, so [the Enterprise] just dives through before the Vortex collapses. The script demanded that the Vortex emit something to protect the Enterprise — 'chronometric particles' in technobabble."

Using a CG model of the Enterprise-E for the shots entering the Vortex, ILM's team employed a particle renderer to automatically create interactive lighting and shadowing on the particles themselves and the Enterprise's geometry within Renderman.

The miniature Enterprise-E again comes into play as several crewmembers go for a stroll on the starship's exterior in order to thwart the Borg's plan to reconfigure the deflector dish into a homing beacon to signal reinforcements. Although maneuvering the new Enterprise model has been likened to carrying around a station wagon, it's hard to make even a 10' miniature appear convincing in an extreme close-up. That was Rosenberg's mission for the ambitious spacewalk sequence, in which Captain Picard and Lt. Commander Worf creep along the Enterprise's hull toward the deflector. After the animatic was approved by the producers and director, Rosenberg devised a motion-control pullback on the Enterprise which would serve as the backdrop to the live action.

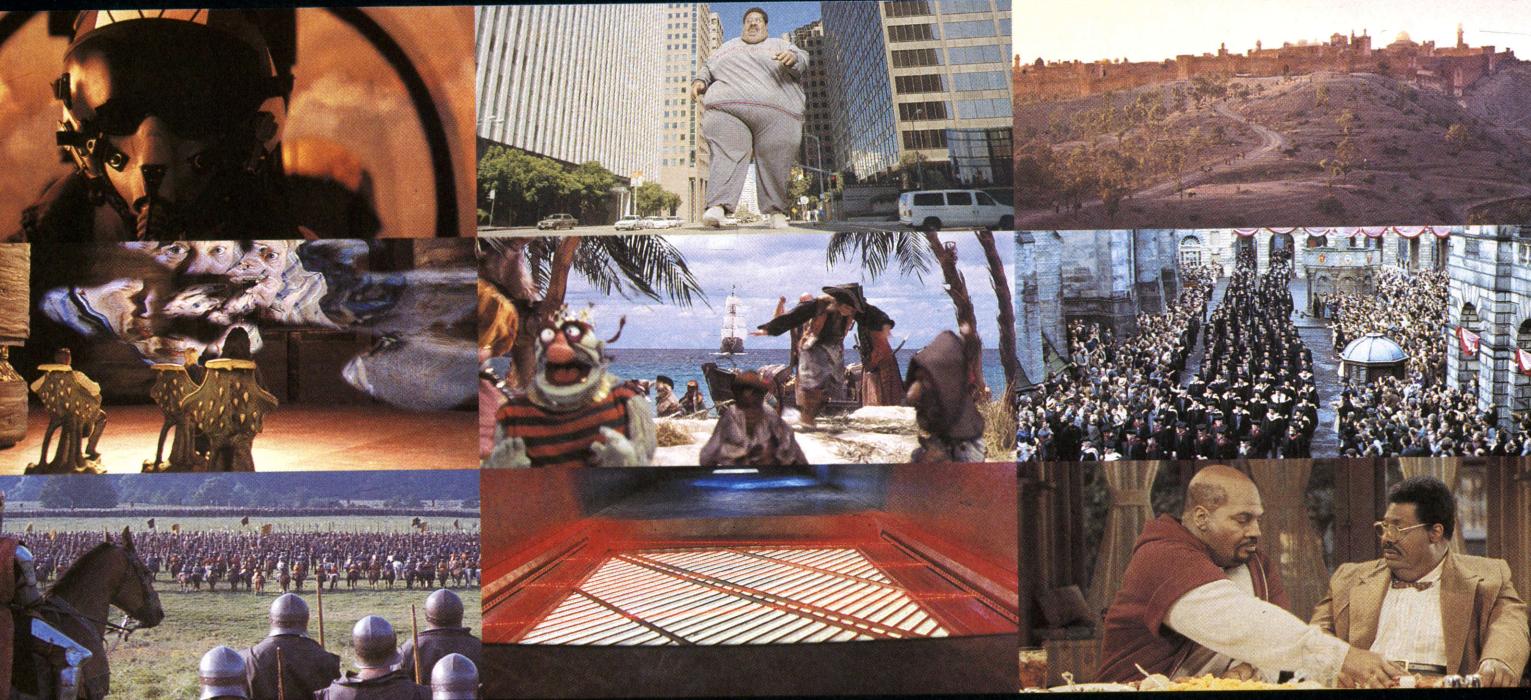
Says effects cinematographer Rosenberg, "The shot starts over the characters' shoulders as they come over the edge of the hull and walk toward the deflector dish, which in reality would be several hundred feet away. The shot lasts 10 seconds, and the camera's pulling back the whole time. To make the shot work, we had to get really close to the model; we were probably $\frac{1}{8}$ " away. Because they're so aerodynamic, the Enterprise models have never had lots of surface detail compared to

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other spaceships, so we didn't get help in that way for scale. Our painter, Jim Smith, had to paint this tiny area of the model for several days to make it come close to holding up for its extreme close-up.

"Even so, being as close as we were, the focus barely held up. We used a tilting lensboard and a wider-angle lens than usual, then shot the deepest stop we could get, f45, and just kept it there as we racked focus. We did an extra motion-control pass where we put down some little dots on the model to make it easier for the compositors to later match-move the actors onto the hull of the Enterprise." (Even on the 10' model, the scale is relatively small: a human figure is $\frac{3}{8}$ " tall.)

When the camera pulls back to reveal the half-lit dish, it's upside down to create that disorienting zero-gravity feeling of space, where "up" and "down" have no meaning. For the wide shots, Rosenberg shot photo doubles walking across a big bluescreen laid out in ILM's parking lot at night.

Adds the effects cinematographer, "We shot [the doubles] from above to get the proper perspective, so they'd line up with the Enterprise's miniature hull in the final composite. Our camera was anywhere from 20' to 60' up. I placed one big 20K light about 200' away as a sun source, and used some blue fill to create lots of bounce off the Earth. I shot with 5298 because I didn't have to worry about the grain too much; it was also a practical choice, because I was trying to light up and cover a 150' bluescreen at night. Shooting at night at ILM was the only way to get up that high and get our lights that far away — it was like shooting on a huge stage. We didn't have any setpiece in the parking lot, so we photographed the actors as big in the frame as possible to get maximum detail, then shrunk them down to fit into the final shot. The compositors then used some computer graphics comping techniques to put the actors on the Enterprise's hull."

Meanwhile, associate visual effects supervisor Moore helmed two weeks of bluescreen

photography on the biggest soundstage at Paramount, where actors Patrick Stewart and Michael Dorn scrambled on a huge — but scaled down — setpiece of the deflector array fronting the Enterprise's fuselage. After consulting with director Jonathan Frakes about how to make the actors appear weightless, Moore put them on wires, had them slow down their motions, and then shot at a slightly higher frame-rate from dutched camera angles. Says Moore, "We shot a lot of the plates with two or three cameras for coverage just to see what worked, and of course the extra angles turned into new shots. We started the hull battle with 45 shots, and when we got the first cut back on the thing, there were 75 shots!"

Shooting on the deflector array, which is oriented 60 degrees off the saucer section on the underside of the ship, quickly became confusing with only a bluescreen curtain hanging behind the setpiece. The rest of the Enterprise-E, not to mention the background of space and the Earth itself, were effects elements to be added later on. Notes Moore, "Because we were at this very odd angle on the underside of the ship, we quickly got turned around and confused about where everything was in relation to the setpiece. I brought a Powerbook onto the set, reconstructed our setpiece and simulated the camera angles we were shooting, and incorporated some quick CG models of the Enterprise and the Earth. I then showed them to Jonathan [Frakes] so he could understand what we'd eventually be seeing."

Moore's Powerbook saved the day when Frakes asked for some high-angle wide shots displaying more of the ship. This order entailed blending the setpiece onto the motion-control model, which demanded some very accurate lineup. Explains Moore, "We thought we'd set the camera up in the rafters of the soundstage, but after looking at the computer model, we realized that we would be shooting at completely the wrong angle, and that we'd never be able to make it work with motion control. That saved us from boxing ourselves into a corner

that would have been difficult to get out of."

The sequence was completed with some standard wire removal and bluescreen extraction, some CG Borg blood (created using particles), and the addition of a computer-generated Earth. By mapping a matte painting incorporating actual satellite data of land masses and clouds onto a 3-D sphere, Moore could relight the Earth and adjust the perspective of the shot.

Besides overseeing the spacewalk sequence, Moore was also responsible for look, lighting and color consistency issues. "I set up some processes to manage the color consistency throughout the show," he says. "We had a lot of sequences that related to each other, so it was important to chase down Earth, star and gas colors, and to keep track of how the spaceships were looking, to ensure that everything matched from shot to shot."

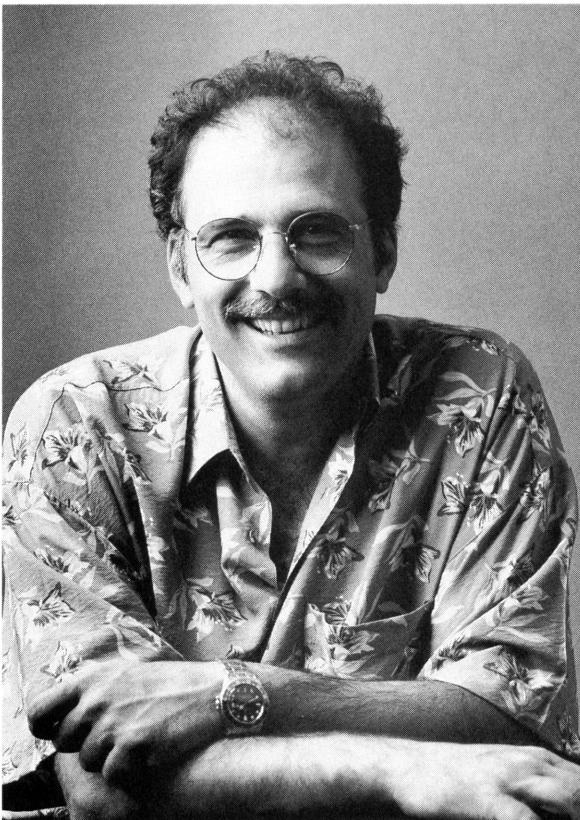
Another first for this *Star Trek* film is that audiences will finally learn how the lifeboats on the edge of the Enterprise's saucer section are deployed. Effects supervisor Knoll admits, "We didn't modify the Enterprise model. At one point, we planned to make a large-scale saucer section with all of the pits from the evacuated lifeboats built in. As it turned out, it was actually easier for us to not only eject the pods in CG but build those pits into the saucer in CG."

Effects art director Jaeger had to design how the pods were going to come off the Enterprise. "We decided that the triangular outside panels are the heatshields, so we just extruded that shape out of the saucer. The lifeboats are just big enough for four people. They look almost like three-legged tables, with thruster pods sticking out of the three corners and a hatch in the middle." As for their movement, Jaeger executed an animatic which was copied exactly by ILM's CG artists.

Why would anybody want to abandon ship? Perhaps because the Borg have assimilated the Enterprise and much of her crew. While the Borg Hive was created by Illusion Arts, it fell to ILM

“The Clairmonts have a good system and big ears,” says Director of Photography Angelo Pacifici

Angelo Pacifici has been a DP since 1989, making commercials for Coca Cola, American Airlines, Pacific Bell, Acura, Infiniti, Budweiser, Kodak, Disneyland, Heineken, Minolta, Spain Tourism, General Motors, Lincoln Mercury, Marshall Fields, The National Guard and others. He was DP on the feature California Myth and he has shot numerous rock videos.



“The Assistants I work with are much happier when they get to prep at Clairmont,” says Angelo Pacifici. “They tell me things pretty much go like clock-work over there.”

Systematic

“They go in, the equipment’s ready, they deal with one person, they get answers. They get what they need, everything works, they get out again.”

Wild Knob

“Shooting spots, I often put together oddball packages. But at Clairmont I’m confident I’ll get whatever’s on my list—even if sometimes it isn’t on *their* list. A wild control knob for the Speed-Aperture Computer, for example.”

“The day before that shoot, the client and agency were still making changes. Actors would be moving in and out of frame at different speeds. I suggested ramping the Speed-Aperture Computer up and down at will. Not to programmed settings, but on the fly.”

Overnight

“While the prep was going on, I called Alan Albert to ask whether a wild control like that existed for the S.A.C. It didn’t; but he had Clairmont build one for me, literally overnight. They delivered it to us next morning, on the set in Long Beach.”

Unsung Heroes

“The Clairmonts have big ears when it comes to what people need,” says Mr. Pacifici. “I can call Jim Meade for a piece of custom gear and I know it’ll be designed intelligently. It’ll also work smoothly and even *look* great. Guys like Alan and Jim are the unsung heroes of this business.”

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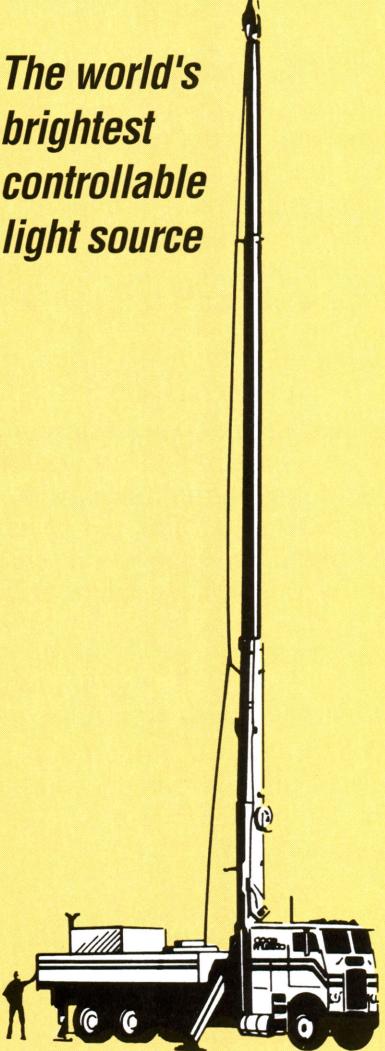
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to imagine exactly what happens when a faceless Federation crew-member is Borgified. Alex Jaeger visualized the horrific moment: twin cables emerge from the Borg's knuckles, burying themselves in the crewmember's neck and burrowing under the skin, leaving bruise trails in their wake. As the color drains from the crew member's face, some of the worm-like tubes coursing through the victim's body break the skin, forming Borg Servos, mechanical sockets to which the Borg can add other pieces of hardware. This transformation was, of course, computer-generated. The wormlike geometry was animated over the actor's face, after which his skin texture was added over the animation. Says CG Supervisor Zargarpour, "We mapped the original face texture onto our 3-D geometry, distorted it, and relit it. Then we altered the skin color using shaders."

Some of the most audacious effects work on *First Contact* involved the Borg Queen (Alice Krige). The mechanical maven is introduced in the assimilated Engineering Room as a disembodied head and shoulders on a chrome steel spine. As she is lowered into her Borg body, she carries on a conversation with the captured Commander Data. The illusion was created using a combination of ILM's CGI and practical makeup effects by Michael Westmore and Todd Masters. Jaeger outlined some diagrams of a rig that would lower the actress on the set. Next, he determined a means of applying the prosthetic spine over a blue suit so ILM could later remove her lower body. This strategy enabled the filmmakers to incorporate as many real live-action elements as possible into the plates. Says Jaeger, "To get Alice's real head and the prosthetic spine all in one shot, we had her lay down on the rig, which was at a 45-degree angle behind the prosthetic. She then extended her neck so it appeared in line with the spine. She wore a blue body sock so we could lose the rest of her body back at ILM."

Adds Knoll, "We didn't want it to look as if she was on some hard mechanical rig; we wanted her to have the appropriate

'float.' We also tried to make the action continuous enough so it wouldn't look as if we were waiting for an effect to happen."

Using separate motion-control passes on the set, Knoll shot both the A-side of the complex effect, which involved lowering the Queen's upper torso and spine, and the B-side, consisting of Krige's entire body. Knoll also videotaped the A-side as Krige descended, then played that tape back as he shot the B-side motion-control pass of the "fully integrated" Borg Queen. This helped ensure that her facial expressions matched, and that both sides of the effect lined up. Says Knoll, "Everything had to line up perfectly, because we planned to use morphs and splits, plus some 3-D animation, to fit the two sides together. That was tricky to execute."

Knoll and company removed Krige's head and shoulders from her standing body in the B-side plate, replacing them with the background and a CG interior of the Borg body suit. Then the Queen's head and spine, lowering on-set, were added from the A-side, until her body parts lined up, at which point the image was imperceptibly morphed back into the shot of Krige's body standing there complete. In the final, very complex single shot, the Borg Queen appears to descend from the ceiling on corrugated cable attached at her shoulders and the back of her head. As her chrome eyes flash from her pale face, the Queen's steel spine disappears into her lower body, which closes up around her shoulders. Finally, mechanical claws grab the skin of her neck and pull it down onto the body.

Reveals CG supervisor Zargarpour, "That whole apparatus was 3-D animation. We re-created her closed body/suit in 3-D geometry, then opened it using Softimage. It's a very detailed model: we had to re-create the back part of the suit inside the body cavity before she lowers into it, as well as the very mechanical-looking hydraulic claws that reach up and grab her skin. This is as daring as *Star Trek* has ever been." ♦

Seeing is Believing

AC offers a selection of the year's most memorable and sophisticated special effects.

While special effects have been a part of motion pictures since their inception, digital techniques have now become so advanced that the phrase "seeing is believing" has become, ironically, both more accurate and more obsolete than ever. On the one hand, effects are now so convincing that audiences can accept the sight of a chopper flying through the Chunnel, or a live cow sailing through the sky with the help of a tornado; on the other, it has become more difficult than ever to tell a doctored image from the genuine article.

For those who work with cameras, it's a point of pride to capture real images, but state-of-the-art digital effects have meant that less and less imagery is making it to movie screens without some enhancement.

This year, more than any other, special effects have been the cornerstone of virtually every potential blockbuster film — from the sci-fi scenarios set forth in *Independence Day* and *Mars Attacks!* to the real-world settings of *Multiplicity* and



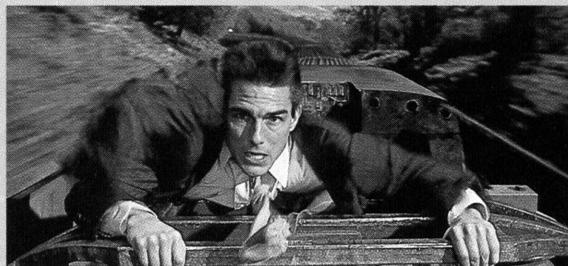
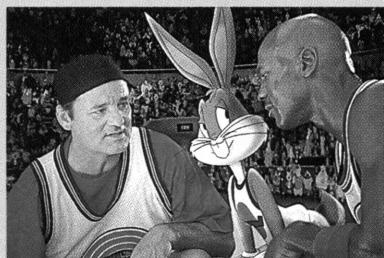
The Nutty Professor, which toy with the laws that govern normal life.

As the computer continues to extend the scope of special effects, the digital tide is influencing not only the future, but the past as well. Indeed, while George Lucas works to digitally revamp the Oscar-winning effects of the *Star Wars* trilogy, the first digital version of a human actor is reportedly preparing for his bigscreen debut: industry word has it that the recently deceased George Burns is slated to celebrate his longevity posthumously by appearing in another installment of the *Oh, God!* series.

Naturally, with so much imagery being created via computer, the role of the cinematographer is changing. Both economic and creative forces are dramatically influencing the traditional art of image-capture. And as motion picture history has shown, those who keep pace with progress will be better prepared to thrive in the industry of tomorrow.

In recognition of this fact, AC continues to keep abreast of the latest achievements in the world of effects. Elsewhere in this issue, we offer articles on both the cinematography and special effects for *Mars Attacks!* and *Star Trek: First Contact*, in the hopes of illustrating successful examples of the new marriage between traditional camera techniques and digital enhancement. For the special section that follows, we have selected some of the year's most eye-catching applications of the very latest visual effects techniques. Hopefully, these articles will encourage our readers to embrace — and not fear or deride — the new tools at their disposal.

—Ron Magid



Clockwise from top: Costars Bill Murray, Bugs Bunny and Michael Jordan team up for a game of interstellar hoops in Space Jam; a CG-enhanced railroading adventure in Mission: Impossible; Sherman Klump's digital transformation in The Nutty Professor; a synthetic cyclone bears down in Twister.

Twister Kicks Up a Storm

After creating a test sequence to help green-light director Jan DeBont, ASC's suspense blockbuster, ILM delivers an array of truly fantastic funnels.

by Ron Magid

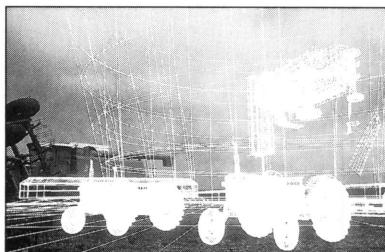
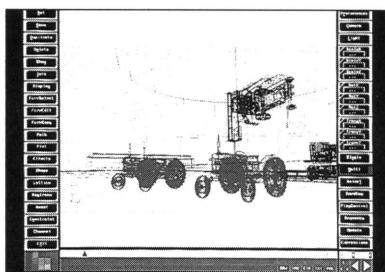
When cinema first emerged as an artistic and commercial medium, filmmakers who dared to portray natural disasters had to rely on miniatures, rain machines and airplane engines to create mass destruction, devastating downpours and gusting winds. In the modern era of digital effects, one might assume that filmmakers could at least control the weather on computer monitors. But natural disasters remain elusive, pushing digital technology to its absolute limits.

Tornadoes, arguably the most demanding natural phenomena, have only appeared in a handful of films between *The Wizard of Oz* (1939) and *The River* (1984). Yet it was that challenge that attracted director Jan DeBont, ASC (*Speed*) to *Twister*'s harrowing tale of two competing teams of "stormchasers" (scientists driven to pursue weather phenomena over vast distances), following a stormfront across Oklahoma.

Notes first-time visual effects supervisor Stefen Fangmeier, "They're not chasing one tornado per se; they're chasing the entire front, which in the course of a day can drop 60 tornadoes. The story takes place over a 36-hour period, one night and the next day. After a certain point, it's a non-stop rollercoaster ride, which is Jan's style. Like *Speed*, it's a giant chase until the stormchasers that realize the tornadoes are chasing them! [The scenario] reminds me of going on a photo safari, where you think

you're stalking these wild animals, and suddenly they turn around and you become the victim. There are a lot of moments like that in this film, because the tornadoes are so unpredictable you just don't know what's going to happen."

Still, producer Steven Spielberg wanted some sort of predictability for the film's virtual tornadoes. Of the mind that digital technology was the only way to go, Spielberg emphasized to Industrial Light & Magic's visual effects guru, Dennis Muren, that if the torna-



does couldn't be achieved via CGI, then there would be no *Twister*. Director DeBont then insisted that ILM's CG tornado should be indistinguishable from the real thing.

As envisioned by DeBont, *Twister* spans the entire five-point spread on the Fujita Scale (the Richter Scale for tornadoes), from a diminutive F1 dust devil to a mile-wide F5 with wind speeds of up to 300 miles per hour and the combined power of three nuclear weapons. Naturally, Spielberg and the director wanted ILM to visualize an F5 for their test. So Muren drove a few exits north of ILM to Novato, California, where he found a dusty road that approximated the film's Oklahoma locale, and shot a 400-frame background plate of the road and little else through his car's windshield. Back at ILM, Muren, along with Fangmeier and *Twister*'s digital tornado designer, Habib Zargarpour, began replicating this unpredictable force of nature in the very regimented realm of computer graphics. But Muren's team wanted to

outdo nature with tornadoes that were nasty, arrogant and purposeful.

Muren soon determined, however, that ILM couldn't create a convincing tornado using a funnel-shaped wireframe; ILM's tornadoes would have to consist of large, swirling volumes of particles and debris, just like their real counterparts. Says Fangmeier, "Those tornadoes were very unusual CG elements, because they didn't have a fixed surface we could paint. Instead, they were made up of particles, and we had to figure out how to control them as we animated the tornado."

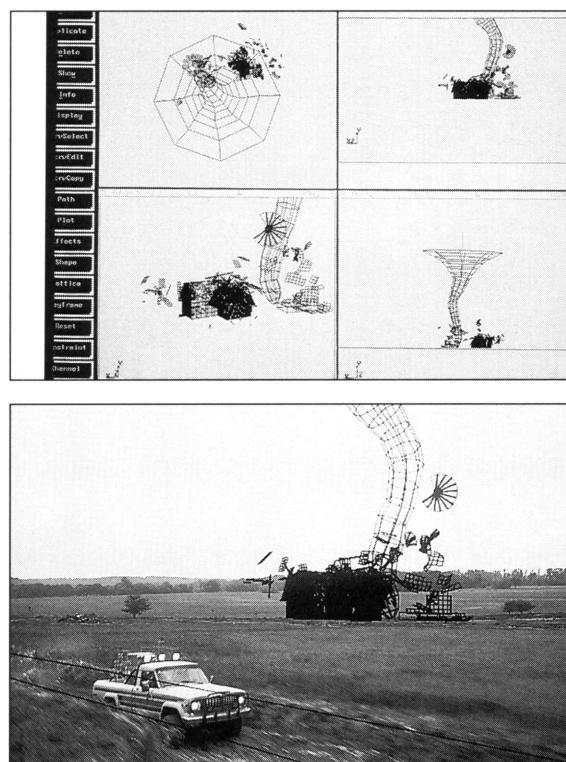
ILM's team designed a tornado-friendly environment, replete with vortex suction, turbulence and gravity, then devised techniques of emitting particles into it. Says Zargarpour, "In our original test, we tried to build the whole tornado out of solid particles swirling off the ground, but even after generating millions of par-

Farm machinery becomes shrapnel: On location, practical effects supervisor John Frazier and his crew used cables and helicopters to create the illusion that an array of combines and tractors had been tossed about by a tornado. But many of the vehicles in the scene were ILM's CG models.

ticles, the tornado didn't look solid enough. But we couldn't fit a larger volume of particles into our computers' memories. There was a lot of pressure on this test, since the whole film was riding on it."

Then Muren struck upon the idea that the inside of the tornado didn't have to be solid, since the audience would only see its outer wall. Although Muren's concept saved quite a bit of memory, and enabled the CG artists to make the tornado walls look much more dense, the test had yet to achieve perfect success. Says Zargarpour, "We realized that we couldn't just throw particles in the air and create a surface or define a shape. They had to have a defined structure. After comparing our reference footage of real tornadoes to our test, I noticed that tornadoes produce clumps, and the best way I knew to simulate clumpiness was to use clumps! Once we devised the tornadoes' basic structure, we could make the clumps go faster or slower to get different looks. The level of internal activity would affect the scale of the tornado — if we had too much activity, it started looking like a large smoke plume from a fire or volcano."

But ILM's final hurdle was in creating mass destruction on cue via CG. Zargarpour explains, "We wanted to be able to smash buildings into thousands of pieces easily and controllably. We built a CG model barn, then developed techniques to line up an exploding barn over it. Next, we had to come up with ways of managing a couple thousand animated pieces — which we simulated in Wavefront Dynamation — so we could choose the order in which the pieces would fly off once the tornado hit.



For example, we wanted the roof to go first. We developed software to trigger the destruction of our CG models in the proper release order, just like doing on-set pyro."

With the entire project riding on the test's success, ILM breathlessly awaited Spielberg and DeBont's reaction to the F5. The duo watched in awe as ILM's massive tornado shattered a barn to bits, then hurled a huge tractor tire through a car windshield. The last two seconds of that 400-frame shot later became the in-your-face climax to *Twister's* trailer.

The film was soon given

the go-ahead, and Fangmeier officially assumed his role as visual effects supervisor. He had previously served under Muren as a digital animator involved in creating the destruction of the T-1000 at the climax of *Terminator 2*; a slew of dinosaurs for *Jurassic Park*; and a stunning 42 minutes of CG character animation for *Casper*. So weather-dependent were the background plates for *Twister* that Fangmeier had to remain on location with the film's first-unit crew for four months. Ultimately, DeBont and cinematographer Jack Green, ASC shot in whatever weather conditions were available (see AC May '95) and ILM's planned slate of 160 shots mushroomed to more than 300.

Fangmeier was soon faced with DeBont's new mandate that the film and its effects should look as rough and documentary-like as possible. For example, the director wanted to see tornadoes moving behind trees as the camera was shaking; this was a tall order for one shot, let alone the 320 effects called for in the film. Fortunately, ILM has made much progress in the match-move department. On *T2*, the background plates consisted of static or motion-control shots; by *Jurassic Park*, ILM's match-move technology had evolved enough to permit a plate shot from the back of a moving truck on a rough road.

But Fangmeier found *Twister* to be his most demanding project to date, saying, "I had to adjust my way of working to Jan's documentary style, which

Top: The stormchasers' truck eludes a destructive funnel; the plate was shot on location by Jack Green, ASC. The CG barn was sequenced to destruct a piece at a time (middle) as the tornado ripped through the structure and was then composited into frame (bottom). The compositing process, the final and most critical leg of any effects production, was especially complex on *Twister*. Veteran optical and digital compositor Tom Rosseter provided the subtle manipulation needed to make bright, sunlit shots appear virtually dark.

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involved a lot of handheld moves without Steadicam. On other films, we always tried to capture all of the measurements on location to make it easier to set up our effects shots back at ILM, but Jan wanted to do his own thing, and he operated a lot of those plate shots himself. He'd drive a mile down the road, handholding a little VistaVision Bowcam, panning three or four times; there was no way we could do any measuring to help match-move our effects into those plates. He also liked to run 45-second action plates using multiple production cameras, with up to eight rolling at once, for many of the locked-down shots, and then just cut them all together.

"About 60 percent of our plate shots, mostly involving debris, ended up being four-perf because of Jan's way of cutting. But rather than restraining Jan, I had to give him the ability to shoot a row of fir trees, then try to figure out how to put a tornado behind it back at ILM. At first, we were thinking we didn't want to do a lot of tree matting with moving leaves, but we just had to figure out how to marry our effects into those difficult shots." (Fangmeier also added high-frequency camera shake in post to further simulate the tornadoes' rapid approach.)

When Fangmeier finally returned to ILM, he and a skeleton crew of effects artists immediately began defining new ways of compositing twisters behind moving trees and into DeBont's wildly moving plates. While digital tornado designers Zargarpour and LaBounta were content building the tornadoes' general spherical structure using the same technique employed for the test, a different approach would be needed to render so many particles.

Says Zargarpour, "The first test was rendered in Wavefront Dynamation and went quite fast, but Dynamation didn't give us the shadows that really define the look of these huge F5 tornadoes, so we had to add those via other techniques. For the final film, we rendered the particles using a program written by Florian Kainz. The program was based conceptually on our fur renderer, but it was sim-

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plified and created for speed. We had to be able to punch millions of particles in, which would take lots of memory. In the beginning, we were afraid it would take an entire [SGI] Challenge computer with 12 processors to do a frame! Florian's P-render — so-called because it was just for handling particles — ended up being a lot more efficient than that.

"We could motion-process the tornado's structure and light the clumps of particles, and if they were dense enough, we could get them to cast shadows on themselves. Then, around the bottom, Henry LaBounta added the Dirt Devils he developed for the film, which was just dust swirling straight up off the ground with the motion simulation of the tornado. That was one of the custom clip effects LaBounta and Chris White wrote within Dynamation, which enabled the software to interpret all of these programming codes and add those kind of effects fairly effortlessly."

At peak activity, when ILM was running some 40-50 shots a day, Fangmeier felt more like a slave to the production than *Twister*'s visual effects supervisor. Realizing he needed help, Fangmeier elevated several key members of his 50-person effects crew to senior positions. Tom Hutchinson and Roger Guyett served as *Twister*'s two CG supervisors. Hutchinson, in addition to supplementing the work of digital tornado designers Zargarpour and LaBounta, acted as shot manager, ensuring that the tornado animators hit their target delivery dates. Meanwhile, Guyett, pulling his first stint as CG supervisor, oversaw a three-man team animating the challenging waterspout sequence, in which three waterlogged tornadoes attack the film's protagonists on a narrow bridge and send a cow flying to its final pasture.

Sandra Ford Karpman, one of ILM's most talented CG supervisors, was named lightning/debris effects supervisor; she was assigned upwards of 115 shots involving sky darkening, reduction of foreground contrast, the removal of highlights and the inclu-

sion of lightning to wrap around tornadoes or shatter the skies. The lightning itself was animated by Leah Anton.

During shooting, Boeing 737 and 747 jet engines mounted on trailers created the huge winds and flying debris one would expect from a real tornado, but the dust endangered the actors. Consequently, in addition to her sky darkening duties, Karpman was charged with animating and sending tons of CG debris — digital dust, leaves, sticks and even large objects such as cars — past the camera in dynamically moving plates. Karpman's teammates soon busied themselves building more than 100 CG models in Alias (TVs, lawnchairs, debris, loose boards, cars, tractors, tanker trucks, cows and other livestock, even houses) that found their way into the tornadoes' destructive swaths.

One exciting sequence featuring plenty of airborne debris involves a tornado tearing through a drive-in movie theater showing Stanley Kubrick's *The Shining*. Says Fangmeier, "We began with a plate where we had people running screaming from their cars, with this white movie screen in the background. They didn't project the film on location because they just couldn't get enough luminance, so we added all of the scenes from *The Shining* — about a dozen shots in all — in post. CG artist David Meny 'projected' the movie onto the screen, after which we put the tornado behind it. Next, CG artist Ben Snow created dust blowing around in front of the screen, so we actually projected the movie through debris; a projector beam shooting through moving dust makes a really dramatic visual."

"When the tornado came through, we modeled the screen in CG and then tore it apart using both hand-animation and procedural animation. Since Jan likes having things fly over camera, we animated the big pieces by hand, placing them in the path of the projector beam so they'd catch bits of the projected image. Having this tornado munch through scenes from *The Shining* was hilarious, but tricky." ♦

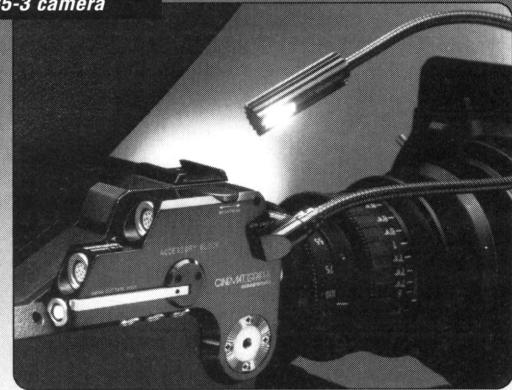
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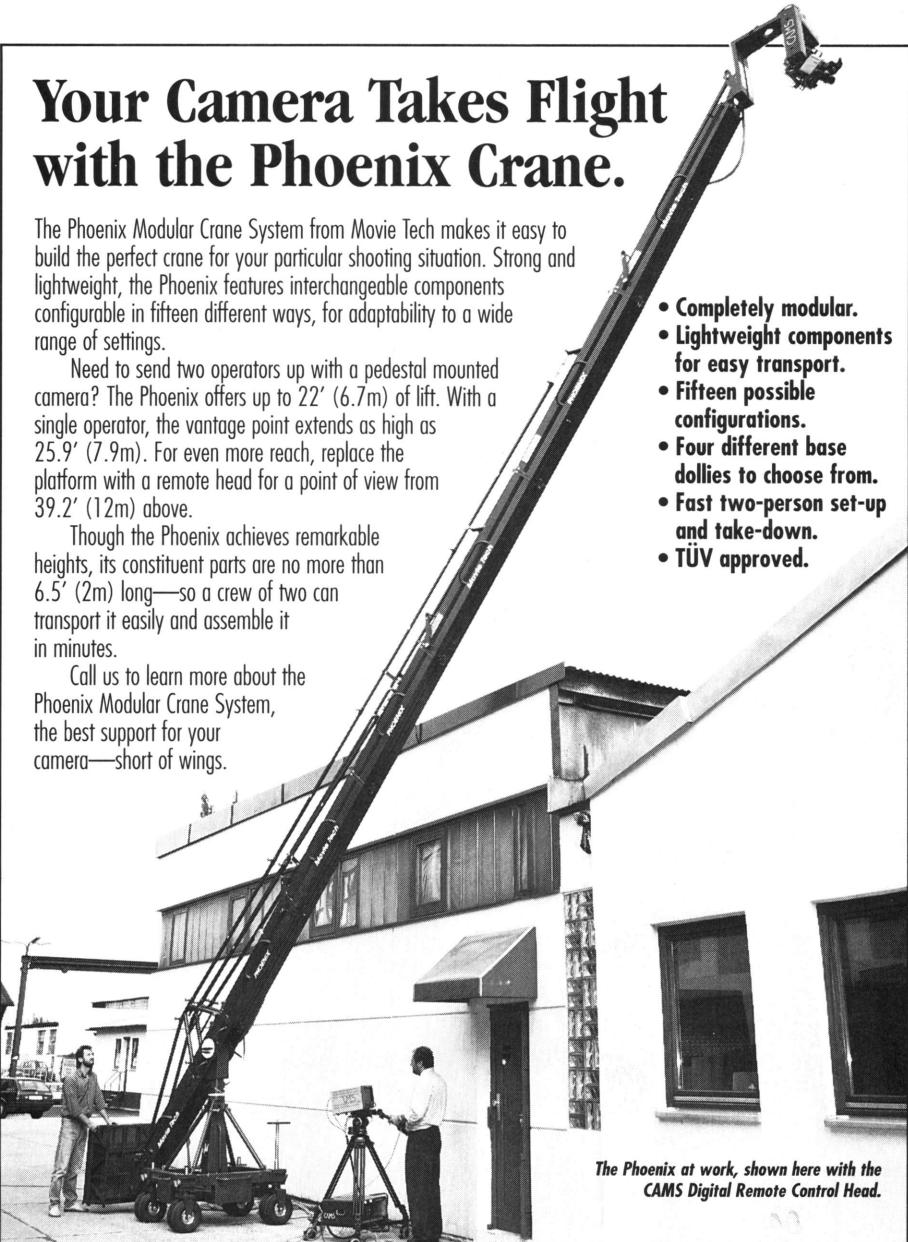
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Making Mission Possible

ILM creates high-velocity climax for *Mission: Impossible*.

by Ron Magid



Mission: Impossible has always been ripe for a revival. With its famous high-velocity theme music (composed by Lalo Schifrin) and enigmatic opening sequence (wherein Mr. Phelps receives his taped assignment in some innocuous setting, be it sewer or sinkhole), *Mission* was among the most iconic TV series of the Sixties.

Just as those microcassette recorders inevitably smoldered into self-destruction, so too has Phelps, who returned in Brian De Palma's big-screen revival not as the hero, but as the hero gone bad.

Saving the world this time around is brilliant young Impossible Missions Force agent Ethan Hunt (Tom Cruise), who must prevent Phelps (Jon Voight), from selling the CIA's "NOC list" — an index of IMF contacts — to some foreign power. After acquiring this MacGuffin aboard a French TGV train speeding at 160 miles per hour through the England-bound Chunnel, Phelps makes his perfect getaway. Employing magnetic grips, Phelps traverses the slick top of the train's rear engine. Hunt follows Phelps — minus any high-tech gear and wearing a sportscoat. The ferocious wind flips Hunt over onto the train's slippery roof as Phelps' ride appears: a helicopter. Helpless to stop him, Hunt desperately clings to the train. There's no place for him to go and nothing to hold onto, which is exactly where De Palma and Industrial Light & Magic wanted him.

ILM contributed 150 shots to the breathtaking seven-minute train sequence, most of them achieved with startlingly real computer graphics created on a variety of Silicon Graphics workstations. "From the time Ethan climbs onto the train till the end of the sequence, every single shot was a visual effect," maintains ILM visual effects supervisor John Knoll (*Star*

Trek: Generations), who handled the sequence. The film's overall visual effects supervisor was Richard Yuricich, ASC.

Using Alias for modeling, Softimage for animation, and Pixar Renderman, Parallax, and 3-D and 2-D in-house proprietary software for rendering, ILM's team created a CG helicopter chasing a CG train into the CG Chunnel. The aim, of course, was to convince audiences that Cruise and Voight were really fighting atop a train going 160 m.p.h., while ensuring that both actors would survive the production.

At Pinewood Studios, the pair performed against bluescreen on a stationary full-scale locomotive set, while a parachuting fan outside created a genuine 160 mile per hour gale-force wind which was ducted to the stage. Aided by the powerful wind and strong off-camera tugs on his flying harness, Cruise did his own death-defying flips and lunges on-set. Cruise flew on wires for the shot in which Hunt loses his grip and hurtles down the entire 65' length of the locomotive, crashing feet-first into Phelps.

Background plates of the real landscape passing behind the train were shot in Scotland, as were the fore and aft POVs of the train travelling down the track. In wider shots, ILM ran its digital train on the real rails; shots of the actors in the foreground were filmed on the locomotive set, which was often digitally blended with half a mile's worth of CG train.

After Hunt tethers the helicopter to the train, the speeding bullet screams into the Chunnel, whirlybird in tow. Although a genuine McDonnell Douglas MD520 No-Tar was brought to Scotland, the real chopper couldn't fly fast enough to keep up with ILM's CG train. Knoll shot the entire sequence without the helicopter, then later added the MD520 digitally. However, the failed shoot yielded a cache of 'copter reference, which ILM matched to their handpainted textures. "People can't believe that's not a real helicopter," Knoll crows. "It doesn't look the tiniest bit synthetic."

Neither does the Chunnel, another ILM CG creation. While

CG objects — whether Terminator, dinosaur or twister — have always been combed into live-action scenes, the *Mission: Impossible* Chunnel demanded entirely the opposite approach: combing two actors on a locomotive set into a completely computer-generated environment.

There were some distinct advantages to this approach: the virtual Chunnel didn't have to be pitch-black, as it is in reality. Instead, the ILM crew lit their tunnel sporadically, not only to illuminate the action, but to create the sense that the train was really barreling along. Large CG lights spaced every 100' acted like picket-fence posts on a model railroad, conveying speed; the huge blue CG cross-ventilation ducts passing by less frequently were the "telephone poles," providing progress. Strobing lights on the set made the actors and the train appear to constantly move in and out of light; this, combined with the wind, created the illusion of tremendous speed.

As Phelps frees the helicopter's cable, the whirlybird lunges, its blades chopping murderously close to Hunt. Then Hunt makes a heroic leap from the train onto the helicopter, slapping a wad of plastic explosive onto its windshield. The ensuing blast blows Hunt back onto the train, right into camera.

Here, ILM achieved some remarkable sleight of hand. While working on the explosion shot, Knoll switched the CG helicopter for a $\frac{1}{8}$ -scale miniature. To match their CG train's virtual 200 m.p.h., Knoll's team shot at 120 frames per second as a gigantic electric motor propelled the chopper model through a 120'-long Chunnel miniature at 50 m.p.h.

In a classic "out of the frying pan" scenario, the train brakes as the fireball of whirling death slams into it and then heads straight for Hunt, who escapes by the narrowest of margins. By using Silicon Graphics software on SGI workstations, ILM truly managed to realize the impossible. ♦

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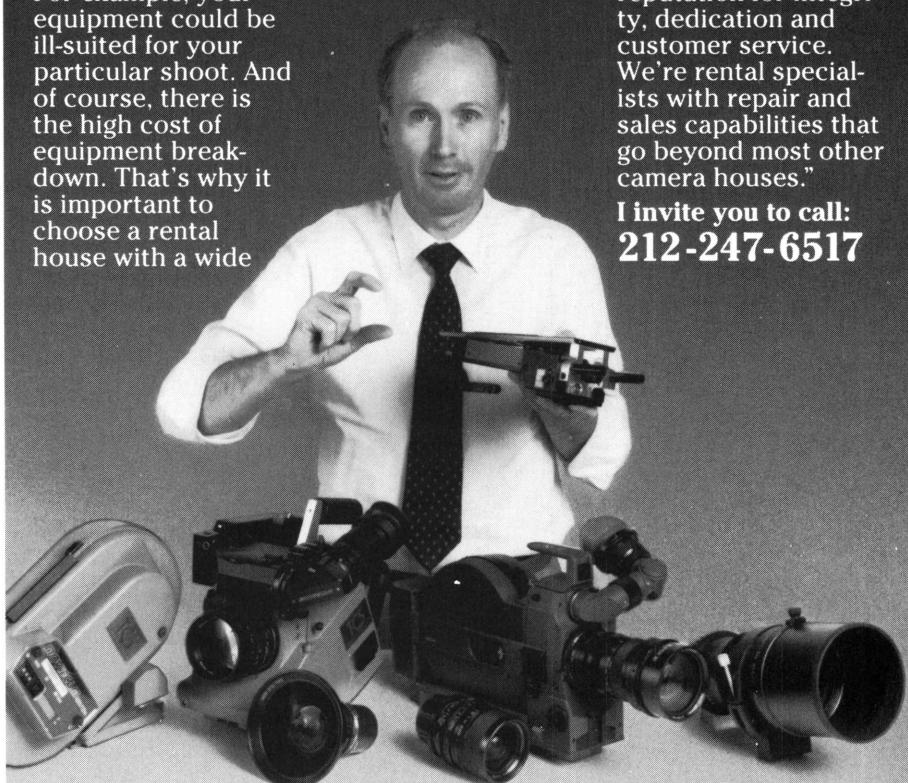
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Jaw-Dropping Effects Add Heft to *The Nutty Professor*

Rhythm & Hues puts the "morph" into "mesomorph" as Eddie Murphy pokes fun at the Jekyll and Hyde mythos.

by Ron Magid

**Sherman Klump
(Eddie Murphy)
reveals his
inner self with
some help from
Rhythm & Hues.**

Who says the morph is dead? The once-overused technique was reinvented this past year to update Jerry Lewis' classic Jekyll and Hyde spoof, *The Nutty Profes-*

sor. The new version stars Eddie Murphy in a dual role as porcine professor Sherman Klump (under Rick Baker's stunning fatsuit and foam latex appliances) and as svelte (yet obnoxious) womanizer Buddy Love (sans makeup). To ensure that both of Murphy's incarnations were imaginatively realized, visual effects supervisor John Farhat hired Rhythm & Hues, fresh on the hooves of their Oscar-winning effects for *Babe*, to create some 40 transformation shots. Other shots were handled by effects guru Mat Beck (*The X-Files*), as well as Computer Film Corporation.

Reconstructing Murphy from chubby Klump to slim Love and back again was a tall order, but keeping these moments funny and original throughout the film was an even greater challenge. Attempting unique effects via morph technology, the most overused and abused of all digital effects, could have been a suicide mission, but Rhythm & Hues visual effects supervisor Bruno George and his creative team seized the chance to prove that morphs were merely misunderstood.

After accurately lining up both sides of Murphy's screen personalities, George's crew performed the relatively simple morphic transition. But that was only the beginning. Rhythm & Hues dove head-first into creating a morph/animation tool, combining their in-house proprietary processing software and Elastic Reality to master the sometimes problematic blend of the morph and 2-D and 3-D CG animation. Then George's team used this

unique software synthesis to explore the physics of human motion as Klump's mass changed direction, stretched and shuddered.

But Rhythm & Hues' animators couldn't help empathizing with the morphing Murphy characters. The physical and emotional divisions between Klump and Love led the animators to examine just how such swings might affect the twin personas' feelings. Visually, that split was expressed via morph/animation software.

The film's climactic Graduation Ball sequence, in which Klump and Love are revealed as one and the same, was particularly difficult. Two very long cuts, one showing Klump shrinking down into Love, the other depicting Love swelling up into Klump, demanded intense doses of visual effects. By combining overlapping layers of morphs with 3-D animation, George's crew created imperceptible effects that had a novel impression throughout the sequence.

The unmasking occurs on a stage, as Klump/Love fights himself, à la Peter Sellers' Dr. Strangelove in Kubrick's classic. But there's a distinct digital twist as both of Murphy's personalities emerge from his body simultaneously. With his appendages rapidly swelling up and thinning down, Murphy repeatedly punches himself in his face(s) with Klump's or Love's fist. Rhythm & Hues carefully tracked their animation to Murphy's dynamic motions as Klump's body changed into Love's. Murphy's two bodies had to appear to be one and the same on both sides of the transition, rather than simply looking like two Eddie Murphys — one in makeup, one without — morphed together. "The two characters share faces and fists," George says. "It's very manic, like a pinball game!"

As with playing the ricocheting silver ball, in comedy timing is everything. Often, George and company tweaked their morph transitions, timing them to deliver the biggest laughs in every scene. The result was not only a triumphant return for morph technology, but for Eddie Murphy as well. ♦



Only a handful of feature-length movies have successfully extended the realm of fantasy by casting animated characters and actors in key roles. The list includes *Who Framed Roger Rabbit?*, *Pete's Dragon*, *Mary Poppins*, *Song of the South* and *The Three Caballeros*. Now there is *Space Jam*, the first offering from the Warner Bros. feature animation division.

The film begins as cute little "Nerdlucks" from deep space drop in on Earth to kidnap Looney Tunes characters and make them into indentured servants at a failing intergalactic theme park. The wily Bugs Bunny convinces the Nerdlucks that they have to follow Earth rules by defeating their victims in a basketball game. The gullible aliens agree to the competition, but stack the odds in their favor at game time by transforming themselves into menacing monsters with extraordinary abilities and powers. Not to be outdone, the wily Bugs has convinced basketball superstar Michael Jordan to play for Toon Town.

Space Jam was inspired by the success of several "Hare Jordan" Nike commercials directed by Joe Pytka, both featuring Bugs and the Chicago Bulls guard.

In bringing this concept to the big screen, Pytka shows off the aesthetics and comedic timing he perfected as an award-winning TV commercial director. *Space Jam* is only his second feature; the first was the 1989 comedy *Let it Ride*. Key players behind the scenes on *Space Jam* included producer Ivan Reitman (director of *Dave*, *Ghostbusters* and *Twins*), cinematographer Michael Chapman, ASC (*Raging Bull*, *The Fugitive*) and visual effects supervisor Ed Jones (who earned Oscar and BAFTA awards for his work on *Who Framed Roger Rabbit?* in 1988).

Intent on getting cutting-edge effects for their animated adventure, Pytka and Reitman asked Jones to temporarily shuck off some or most of his everyday management responsibilities as president and CEO of Cinesite so that he could concentrate on *Space Jam* for 15 months.

"For the past several years, people in this industry have

Space Jam: A Special Effects Slam-Dunk

Animation and live action blend in a wild and woolly game of intergalactic hoops.

by Bob Fisher

been talking about using virtual backgrounds as settings for telling stories," says Jones. "We did it. The backgrounds for about one-third of *Space Jam* were computer-generated. We also made some important breakthroughs in the use of a fluid camera movement for filming characters against greenscreen backgrounds. That changes the visual dynamics of the story."

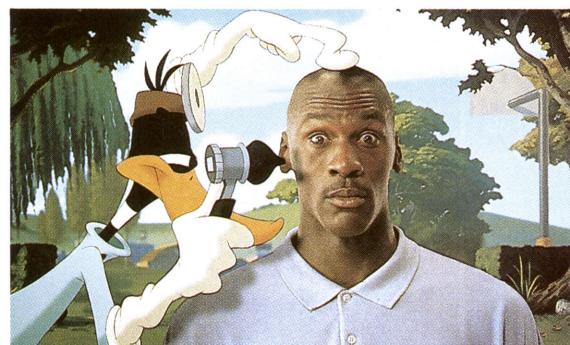
Jones notes that approximately 1,100 digital effects shots



were woven into *Space Jam*, insisting, "We didn't want the film to look like a Saturday morning TV cartoon. If anyone had any doubts about the value of working in 10-bit color space in digital postproduction, the filmic look that characterizes *Space Jam* should resolve the issue."

Many people have already compared *Space Jam* to *Who Framed Roger Rabbit?*. However, as Jones notes, the differences in the application of imaging technology underlines the incredible progress that has been made in the evolution of digital technology during the past eight years.

In the case of *Roger Rabbit*, Jones notes, "Synthetic characters were created with traditional film animation, and they were integrated into the live-action world with optical compositing techniques. The principal cinematogra-

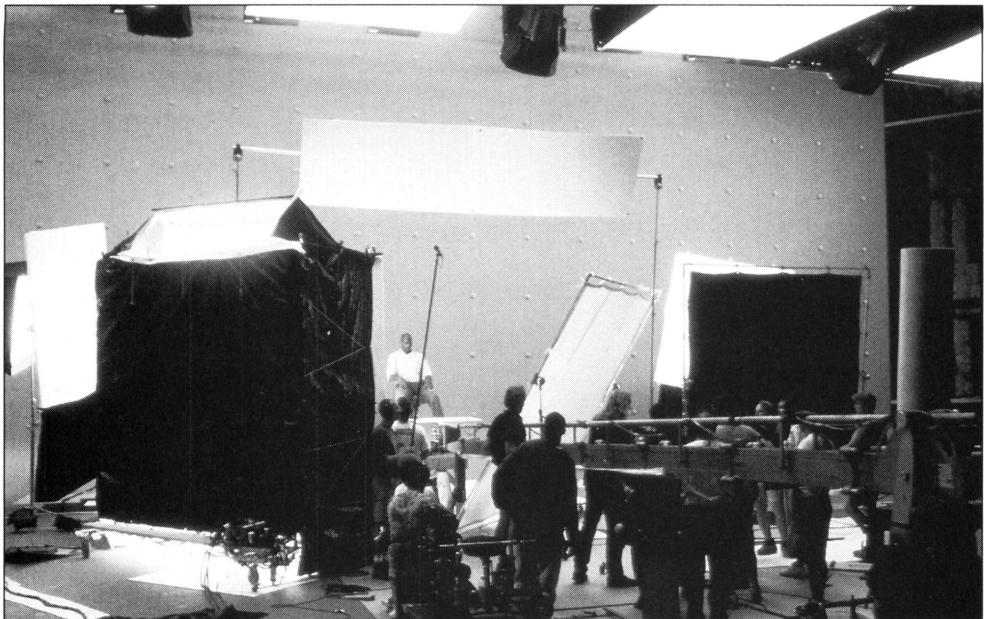


phy was done by Dean Cundey [ASC], but bluescreen elements were recorded in VistaVision film format by an ILM camera crew. The camera was comparatively static, because of the need to precisely match foreground and background elements during optical compositing."

By contrast, he notes that on *Space Jam*, "We created many computer-animated characters and objects, and digitally composited them with flesh-and-blood characters. We also used the computer to create virtual environments as background settings. Michael [Chapman] handled all of the greenscreen camerawork in addition to principal cinematography."

Jones explains that Cinesite enhanced the motion-tracking software previously developed for *Under Siege: Dark Territory* for use on *Space Jam*. The modified software eliminates the need for a computerized motion-control system during filming. "This makes camera movement much more fluid, and the angles of photography are unrestrained," he details. "The motion-tracking software we developed for *Under Siege: Dark Territory* was primarily used for very linear moves along X and

Left: Suited in greenscreen material, a performer acts out Daffy Duck's medical exam on Michael Jordan (as seen above in the finished shot). In many scenes, actors from an improv theater served as stand-ins for Bugs, Daffy and other animated characters, giving Jordan a target for eyelines. The stand-ins generally recited the characters' lines while the greenscreen element was being recorded on film.



Above: The greenscreen stage at Warner Bros. Cinematographer Michael Chapman, ASC primarily used large soft sources. During the filming of the greenscreen elements, NBA players were recruited and outfitted in green suits (right). They passed the ball to Jordan and generally interacted with him. Jordan didn't have to be motivated to display his athleticism, but the presence of the other professional players on the court helped lend a tactile edginess to his performance. The green suits made it easier for the computer artists to remove the other players from the film after it was digitized, since they blended into the background.

Y axes. Joe [Pytka] also wanted a lot of movement on a Z axis, which creates a more spatial feeling. He is known for his dynamic images, including the use of Dutch angles. A lot of times we were shooting on the greenscreen stage, and he was playing loud mood music in the background, urging Michael to be spontaneous while tracking an element for a composite shot."

Much of the film takes place in two computer-generated environments: a basketball arena which seats 25,000 people, and a practice gym. "There was a lot of discussion about how cartoony and how realistic the overall look should be," says Cinesite art director Carlos Arguello, who served as the digital visual effects supervisor on *Space Jam*. "Until you see the characters working in the environment, you don't really know what the final look should be. The advances we have made in digital postproduction gave us the freedom to make those adjustments."

Arguello cites one example: "Originally, the walls of the practice court were made of brown wood. However, after seeing the Tasmanian Devil in that virtual environment, we decided to digitally repaint the walls stadium green. It made a big difference."

Arguello says that early in the production cycle, he spent most of four months at the Cinesite London facility, where staffers had

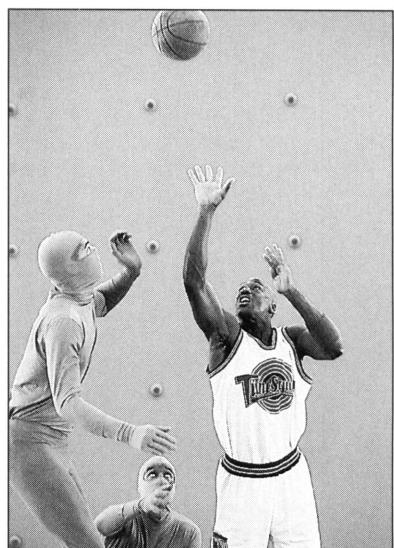
more 3-D experience at that time. The finished film offers many examples of how the flexibility afforded by digital post can make a big difference. In one shot during the game, the camera is moving behind Jordan. A basketball flies by, and Daffy Duck and some monsters move in and out of the shot. Then Jordan turns his head and looks toward the camera. During those fleeting seconds, you see a flare sparkle on the lens, as though it is coming from a practical light in the arena. It is a subtle touch, but it contributes to the ambiance.

"When we were viewing dailies, Ivan (Reitman) saw the flare, and he turned and asked me if we had put it in, or if it had been recorded during principal photography at the arena," Jones says. "He knew that we had never shot a scene in a real basketball arena, so we couldn't have gotten the flare from a practical light. We added it during postproduction, but it looks so realistic that he automatically asked the question."

Some 800 animators and 18 companies around the world worked on *Space Jam*. Warner Bros. animators created rough drawings of the characters and parceled them out to animators who completed the physical drawings. The drawings were collected at the Warner Bros. feature animation facility, in Sherman Oaks, California,

where they were scanned and converted to digital format. The cells were inked and painted digitally at Warner Bros., and the image data files were transmitted to Cinesite, where they were collected by a file server for distribution to artists at individual workstations.

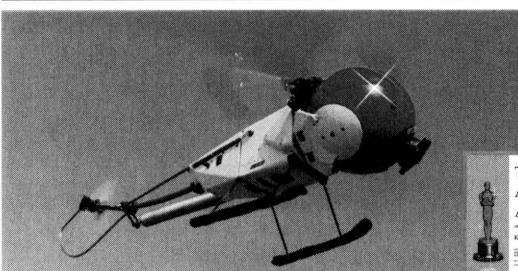
"The average shot consisted of 29 elements," says digital compositing supervisor Doug Tubach. "Some shots had as many as 100 elements. The animated characters were 'sculpted' by the digital artists, who used tonal mattes and added shadows and rim lights to create a three-dimensional look. We broke the animated backgrounds down into as many as seven to 10 different elements to create a unique multi-plane look for each shot, including adjustments in atmospheric conditions from the foreground to the extreme background. There is always a vanishing point when the audience



looks beyond the horizon. There are a lot of subtle touches which are more art than technology."

The greenscreen elements were filmed at Warner Bros., on a stage about the size of half of a basketball court, surrounded by a 20-foot perimeter. There were green walls behind two sides of the court, and a Mylar cover overhead. The Mylar efficiently reflected green light bouncing off the backgrounds, giving Chapman the freedom to shoot from the low angles that Pytka wanted, and to track with unrestricted movement.

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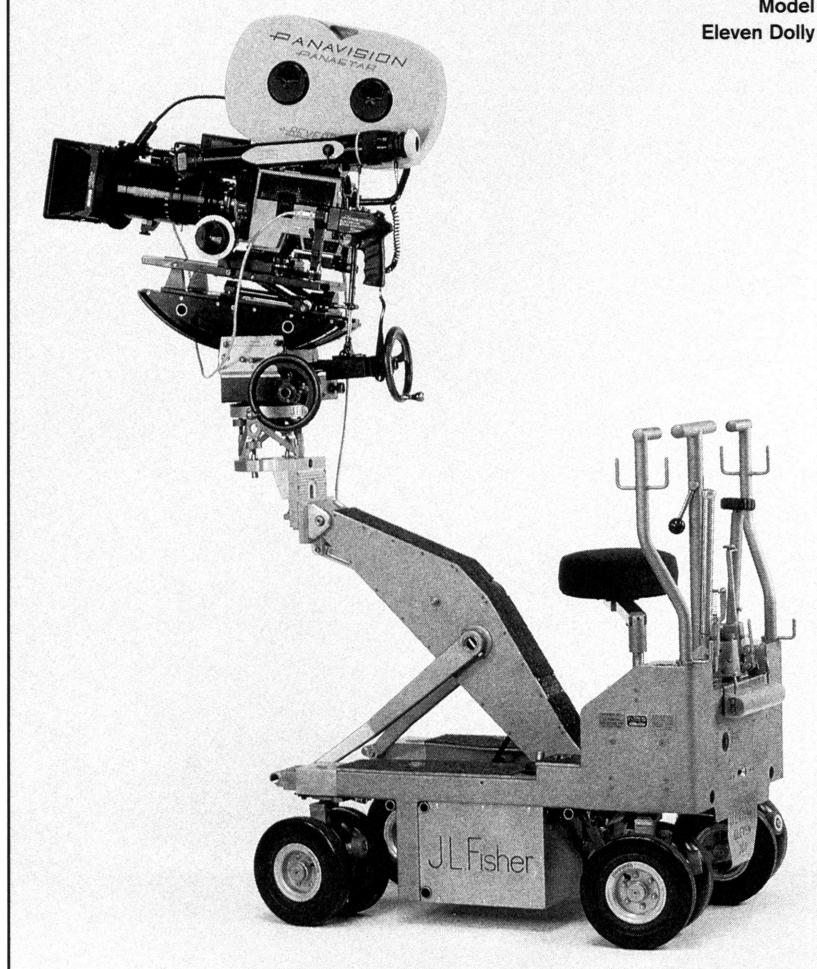
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The green walls were lined with rows of red dots. "They were four feet away from each other in any direction," Cinesite's Mark Michaels explains. "That enabled us to track camera motion within these coordinates in any direction. It gave us the information we needed to create a 3-D map or virtual background for each shot, which accounts for the motion and angle of photography. If Michael Jordan is dribbling a basketball down the court, the background changes as he moves. We also have the ability to alter the focal length of the image and to position Michael anywhere on the court."

However, the ball, the rim of the basket and the net were all live-action film elements. Michaels explains that it is very difficult to realistically simulate the dynamics of what happens when a basketball flies through the air, hits the rim and falls through the net.

"We studied photos taken at four different NBA arenas, including the dynamics of the crowds," says Arguello of the process in creating *Space Jam*'s courtside spectators for the big game. "That played a big role in determining how our computer artists lit the crowds' movements and reactions in contrast to the action of the court. We studied the relative brightness of the arena compared to the level of brightness on the court. We wanted the floor to be semi-reflective. That justified the use of reflections of the action on the floor, in addition to digital shadows which were added to the scene.

"We basically flopped the animation of characters and live-action film of Michael Jordan, stretched them out appropriately, and composited those images into the scene wherever we felt it was appropriate," he adds.

"To create the crowds, we experimented by filming live-action characters against a green-screen background. Later, we digitally pasted on heads of some 20 computer-generated characters from the Warner Bros. library," he says. "We lit the CG arena the same way a cinematographer would have lit it as a live-action scene. You have to make the lighting and

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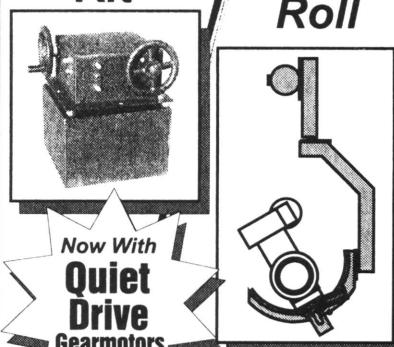
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look work for each shot." He estimates that about 80 percent of the lighting was created during the original CGI work. About 20 percent was retouched during final compositing. "Much of it was very subtle. For example, a slight alteration in the color of the arena from light to dark could affect the visual emphasis of the scene by drawing the eyes of the audience to the brightest part of the frame."

The animators also created hallways in the arena, and characters are seen walking through them and up and down the aisles. The images of the characters are a bit abstract; their features aren't recognizable, but there is a distinct impression of normal activity.

That raises a question, of course: why create a virtual environment? Jones responds that the computer actually provides more creative flexibility for choosing extreme angles of photography from an artistic perspective. It would also be more difficult to control the crowd and lighting situations in a live-action scenario. "If you think about the Looney Tunes cartoons from a historic perspective, there are always very oblique and exaggerated camera angles," he says. "We wanted to replicate that aesthetic in this film, because it feels right to people who remember the cartoons."

Another factor was that while Jordan has a dominant presence in the film, he was only available for about 12 weeks of photography. Jones believes that it would have taken much more time and effort to stage and shoot the basketball scenes in a live-action environment, especially with the aggressive camera movement and angles needed. "We used low tracking camera moves and high angles of photography that would be difficult to match with a live-action film crew shooting from either a dolly or crane," says Jones. "We augmented the images with jumps and pops that are very smooth, and added motion blur, lens flares and other enhancements."

One of the challenges was matching the grain in film elements of composite shots with the computer-generated backgrounds and

characters. The Cineon compositing software package provides an option for matching the grain and texture of all Eastman camera films. Tubach explains that Chapman shot the greenscreen elements with the Eastman EXR 5293 and 5296 film; the digital artists were able to replicate the grain and texture characteristics of that film in the CGI elements.

"In one scene, a spaceship comes out of the clouds and crashes in a supermarket parking lot," says Arguello. "There's an explosion which creates a crater. We filmed a small, controlled explosion in a parking lot from two angles with different lenses on the cameras. We had to decide whether to build and film a model of the spaceship, or create a computer model. We mainly did the latter, though there is some use of a [real] model. When we combined film of the explosion, including fragments flying toward the camera, with a matte painting of the crater in the foreground, and the spaceship, it looked convincing."

Tubach says that artists were generally assigned to specific scenes and sequences to ensure consistency. Some animators are more attuned to performing certain tasks, and even to animating particular characters.

Cinesite Los Angeles operates two Kodak Lightning digital film scanners, which are capable of capturing and converting all of the image data in the original 35mm negative, including 10 bits of color per pixel, into digital picture files at the rate of approximately two seconds per frame.

"At full resolution, we are capturing around 40 MB per frame, at 10 bits deep in color space," says Jones. "That enables us to replicate the gray scale from the deepest blacks to the purest white, with the full range of mid-tones in between. You need a digital picture file that accurately represents the quality of the original image, and is capable of maintaining that look through digital postproduction."

The completed shots were transported to a Kodak Lightning digital film recorder, which uses a high-intensity laser light to "write" the images onto ultra-fine grain

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Eastman EXR 5244 color intermediate film, a technique which contributed to the filmic look.

Cinesite moved some 10 terabytes of data during this project. "If you stored that much data on floppy disks," Jones says, "they would fill a 10,000-square-foot warehouse. The ability to manage that much data efficiently was a key to completing this project on budget and on a relatively short deadline — about a year less than most movies containing this much animation — without compromising production values."

While Cinesite made use of a wide range of off-the-shelf software from Cambridge Animation, Alias, SoftImage and Discrete Logic, the show's mainstay software was Kodak's Cineon package for compositing and retouching. Cinesite also developed some Cineon software enhancements for motion blurring and for interpolating facial expressions in character animation, in addition to the improvements in motion tracking. All of the work was done on Silicon Graphics platforms.

Asked about the ramifications *Space Jam* will have for the future, Jones cautions that with all of the freedom implied by the rapid evolution of digital effects, it is important to keep in mind that the fundamental rules haven't changed in 100-plus years of moviemaking. "It is still about telling stories with moving images," he says, "only now we have a bigger tool kit that gives us more flexibility. It's up to us to use them in appropriate ways. Digital technology doesn't make you more creative. It gives you more opportunities to express your vision. It also creates incredible pressures to shorten postproduction schedules. That's the downside."

Arguello agrees: "We were working on the cutting edge of imaging technology, but it all came down to telling a story." ♦

Throughout the year and specifically in this issue, AC endeavors to detail the latest advances in visual effects wizardry, and to demystify the most advanced methods of optical trickery. However, as technology continues to move forward into the realm of what previously had been perceived as science fiction, many fundamental effects techniques are often assumed to be common knowledge. In a constantly changing field such as special effects, though, this is usually not the case.

The color difference traveling-matte optical process has been in use for the last several decades. But after the 1977 release of *Star Wars*, the process earned a newfound respect in the motion picture industry. Since that time, filmmakers and effects artists have demonstrated an ever-increasing interest and vigor in pushing the boundaries of technology to deceive and delight audiences. With the advent of digital film scanning, electronic image manipulation and computer compositing techniques, the use of bluescreen (or green- and/or redscreens) has reached an unparalleled level of sophistication. Still, many filmmakers seem to forget that photochemical bluescreen compositing required exacting precision in order to achieve believability, opting nowadays to invoke that ever-popular battlecry, "We'll fix it in post!"

Some of the top visual effects artisans working with blue- and greenscreen photography strongly caution against such naiveté. "The flexibility and wider tolerances of digital systems have made the process much more forgiving, but my warning is to avoid getting sloppy," says visual effects director of photography Chuck Schuman, who has provided highly regarded bluescreen work for such recent films as *The Ghost and the Darkness*, *The Indian in the Cupboard*, and the upcoming *Con-Air* and *Michael*. "The people doing the on-stage work have to be diligent in keeping their tolerances tight. Sure, you can fix it in post, but with a little extra effort you can create perfect results on the stage."

Visual effects supervisor Eric Brevig, who works at

Bluescreen/Greenscreen 101

Technical experts discuss the best way to achieve seamless results with matte photography.

by Christopher Probst

LucasDigital's Industrial Light & Magic, explains, "The decision about whether to execute a shot via blue- or greenscreen is essentially based upon economics. Is it the most cost-efficient way to create the shot? By doing a blue- or greenscreen shot, you're trying to make something look as if it is somewhere else. This may be for safety reasons: filmmakers often want to place an actor or stuntman into an environment that would be too hazardous to actually execute. In other cases, they have to put the talent in an environment that would be too expensive or impractical to build, or in a place that is impossible to shoot, such as outer space or a planet surface. The

choices about how to do these shots are then narrowed down to about two or three techniques: rear-projection, front projection — which I don't believe is used at all anymore — and traveling matte compositing, i.e. blue- or greenscreen."

The choice between photographing a subject in front of a bluescreen, greenscreen, or even a redscreen is a critical factor in creating a believable and successful traveling-matte composite. That decision "really depends upon what it is you're matting," reveals bluescreen cameraman David Stump, who is currently serving as visual effects director of photography for the upcoming *Batman and*

Chuck Schuman's chart of an exposure-wedge test done for *The Ghost and the Darkness* displays how footage shot with either Dazian green fabric or Composite Component's Digital Green paint measured up under the densitometer. The shaded area for each table represents the exposure yielding densities closest to the desired aim density (indicated as the LAD value above). By interpolating between the approximate exposure value (in half-stop increments) and the next closest exposure reading to the desired density, a more accurate exposure choice may be determined.

Prod. Title: <i>The Ghost and the Darkness</i>						
Test No: 12		Meter Used: Pentax V w/ Zone VI Conversion			Date: 10/06/95	
Stock: 5293-269		ASA: 200		N = f/ 4.0 @ 1/50 sec.		
Lens: Zeiss 35mm		Filter: Ø			Base D-Min:	.12 .47 .85
Surface	Digital Green Fabric	Digital Green Paint			Kodak 18% Gray Card	
Light	Fluorescent Green	E.V. 8%	Tungsten @ 3240° K	E.V. 9.85	Tungsten @ 3240° K	E.V. 8%
L. A. D.	.22	1.55	1.05	.22	1.55	1.05
f/	±N	R	G	B	f/	±N
1.4	+3				1.4	+3
1.4½	+2½	.78	2.23	1.60	1.4½	+2½
2.0	+2	.73	2.18	1.55	2.0	+2
2½	+1½	.65	2.07	1.45	2½	+1½
2.8	+1	.58	1.98	1.37	2.8	+1
2.8½	+½	.51	1.86	1.28	2.8½	+½
4.0	N	.46	1.79	1.22	4.0	N
4½	-½	.38	1.66	1.13	4½	-½
5.6	-1	.34	1.58	1.09	5.6	-1
5.6½	-1½	.28	1.43	1.02	5.6½	-1½
8	-2	.25	1.32	.98	8	-2
8½	-2½	.21	1.17	.94	8½	-2½
11	-3				11	-3

Robin, after having previously teamed with cinematographer Stephen Goldblatt, ASC on *Batman Forever*. "If you're matting someone in an all-green suit, using a greenscreen is obviously going to make it a lot more difficult to separate that person from the screen itself. A number of factors contribute to the success of the process, but the actual idea behind the process of color difference traveling-matte photography in front of a blue, green or red screen is to capture the difference between the subject and the color of the screen behind the subject. The greater the difference, the better the matte. Human flesh-tones are mostly composed of red and a fair amount of green information. Of the three color records on film, the color that least contributes to the rendering of human skin is blue. You don't get too much of the shape and texture of human beings in the blue record. However, you might also have a situation in which Arnold Schwarzenegger is wearing a blue costume in a shot. The closer that costume is in tone and hue to the color of the bluescreen, the more likely it is that the costume will become indistinguishable from the bluescreen itself. Therefore, the notion of doing the shot via greenscreen becomes more valuable."

"When you talk about the backing, whether it's greenscreen or bluescreen, what you're trying to do, photographically, is to separate the foreground objects from the background," relates Hoyt Yeatman, founder of Dream Quest Images. "Through the use of exposure and the color difference between the foreground objects and bluescreen/greenscreen backing, we are able to extract the objects digitally or photographically and place them into a new environment, creating a traveling-matte composite. For instance, if you were shooting a bluescreen, the blue layer of the film would ideally be exposed only by the pure blue backing and would contain little or no exposure or information in the red and green layers of the film. In practice though, there is always a certain amount of red and green information found in the film negative of the bluescreen. This is due to

the fact that the pigments or dyes used in the screen are not theoretically perfect; that there is some 'cross talk' between the red, green and blue records within the emulsions of all films; and that the light sources used to illuminate the backings often contain large amounts of red and green energy. It is important to achieve the greatest separation in the film negative between the foreground object and backing through the proper choice of materials, equipment, and photographic technique. I have found that being able to light the foreground object separately from the green or blue backing helps immensely in controlling the quality and accuracy of the finished element. Properly exposing the foreground object and balancing it to the level of the screen is also very important.

"For example, an actor wearing a white shirt against a bluescreen should be exposed in such a way that the 'blue' component and density of the white shirt is less than or equal to, but not in excess of, the 'blue' component and density of the bluescreen. If these

densities and balances are grossly exceeded, the software and algorithms creating the digital composite can be greatly compromised. In practice, I find that shooting a film test a day or so ahead of the actual bluescreen or greenscreen shoot is very important in order to calibrate my light meters, lenses, and film stock. After the test negative is processed, it is read on a color densitometer. As a standard, I expose a Kodak gray card to obtain negative densities equal to LAD (Laboratory Aim Density), which Kodak specifies for each of its film stocks. For instance, in the case of 5247, Kodak recommends Status M RGB (red, green, blue) densitometer readings of .80ND, 1.20ND and 1.60ND for a properly exposed gray card under tungsten light. I would use this density information to expose my foreground subject. As for the bluescreen or greenscreen exposure, I tend to look for a negative density that is between .30ND and .40ND above the LAD density for the appropriate colored screen (blue or green). In other words, for a bluescreen, I would look for a screen density on the negative be-

Another of Schuman's charts, this time for Tempo Blue fabric and Rosco's Blue paint. For The Ghost and the Darkness, the compositors requested a blue layer density of 2.00ND, which is indicated here by Schuman's LAD figures of .20, .80 and 2.00 for the two blue materials. For a comparison reference, an exposure wedge of an 18% Gray Card is also included for both the blue and green material tests.

Prod. Title: *The Ghost and the Darkness*

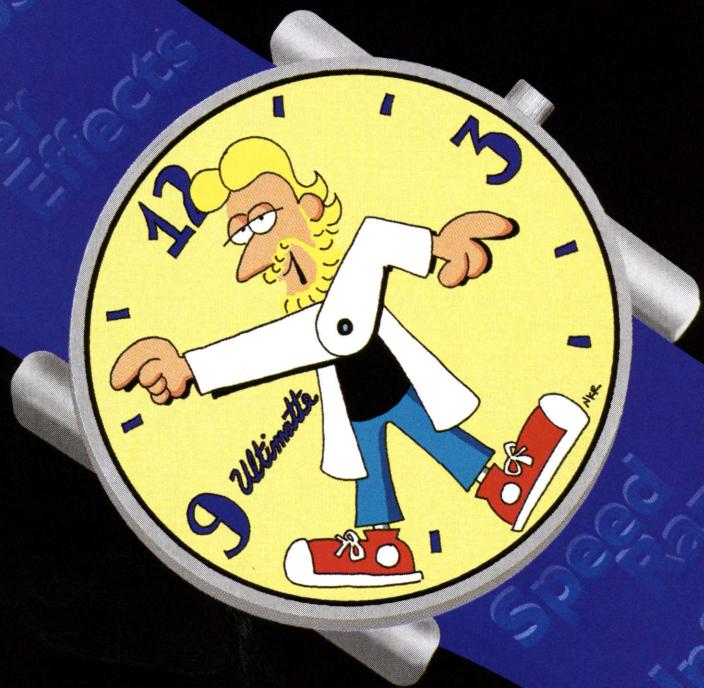
Test No: 17 **Meter Used:** Pentax V w/ Zone VI Conversion **Date:** 11/15/95

Stock: 5293-273 **ASA:** 200 **N = f/ 5.6 1/2 @ 1/50 sec.**

Lens: Anamorphic Zeiss 100mm **Filter:** Ø **Base D-Min:** .18 .57 .91

Surface	Tempo Blue Fabric			Rosco Blue Paint 5722			Kodak 18% Gray Card		
Light	Kino Flo Super Blue		E.V. 9.1	Tungsten @ 3100° K		E.V. 9.8	Tungsten @ 3180° K		E.V. 10.1
L. A. D.	.20	.80	2.00	.20	.80	2.00	.88	1.27	1.61
f/	±N	R	G	B					
2½	+3								
2.8	+2½								
2.8½	+2	.24	1.11	2.42					
4	+1½	.23	1.05	2.37					
4½	+1	.22	.97	2.29					
5.6	+½	.20	.86	2.17					
5.6½	N	.20	.77	2.06					
8.0	-½	.19	.71	1.96					
8½	-1	.19	.66	1.87					
11	-1½	.18	.64	1.77					
11½	-2	.18	.62	1.69					
16	-2½								
16½	-3								

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tween 1.90ND and 2.20 ND. This is just a guide, of course, and the 'optimum' density of the screen should be determined by the individuals responsible for the optical or digital composite."

The choice of available blue- or greenscreen materials also affects the film's response to the color and the intensity of that color in its corresponding emulsion layer. Specifies Schuman, "There's the traditional Dazian Tempo Blue fabric, and now there's the new 'Digital Blue' fabric from Jonathan Erland's company, Composite Components. Both fabrics sufficiently absorb the red and green wavelengths of light and reflect primarily the blue wavelengths to make a very good matte surface. Additionally, there are also paints — Rosco Lab's Super Ultimatte Blue, CC's Digital Blue — as well as a new material called Lonstage, which I've been using since *The Indian in the Cupboard* [see AC August '95] and am currently utilizing on *Michael*. Lonstage is a shiny blue linoleum that I became aware of through dance theater. With the

blue Lonstage, I found that we are now able to have a blue matting surface that is also capable of showing a shadow and a reflection."

Given considerations such as color selection and the emulsion's response alone, not to mention variations in the light absorption characteristics between lenses and different lens coatings, the task of illuminating the often colossal blue- and greenscreens to a proper intensity, color and evenness can stagger even the most sure-footed of cinematographers. But what is the proper intensity and color? "There's a big selection of types of screens and illumination sources that can be used," offers Yeatman. "The purer the illumination source is, the better off you are. If you use paint or fabric screens and illuminate those screens with tungsten light, you're really depending upon the pigments in the paint and fabric to filter out all of the colors except for the blue or green you're trying to photograph. The purity of that color will not be as good as if you

were to light a screen with a light source that only had the wavelengths you required and nothing else. Sunlight, HMIs and tungsten lights all tend to have a fairly broad band of the visible light. Many times, these sources required colored gels to give reasonable results, and they are not always the best or most efficient sources for lighting large screens. A higher-quality light source is a flicker-free, narrow-band fluorescent lighting unit, such as units from Kino Flo, which are power-efficient and color-specific, and can produce very even illumination over large screens."

Adds Stump, "If you're using tungsten units to illuminate a bluescreen, and you do it absolutely by the book and use the correct gel to turn tungsten into chroma blue, you've basically killed easily 80 to 85 percent of the light coming out of the lamp. Rosco Congo Blue #382 quickly turns a 10K into a tweenie, and is therefore not effective or cost efficient. It may be the only option in some cases, but it's not the optimum method."

"There is a rule of thumb

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that I like to use when lighting the screens," reveals Schuman. "First, I like to box in the screen with a top row and bottom row of fluorescents and, depending on the configuration, perhaps some on the sides. If I don't place units on the sides, then I'll extend the top and bottom rows one or two fixtures beyond the edge. You shouldn't just light up to the edges of the screens, because any point in the middle of the screen is lit by the bulbs directly in front of it as well as some spill from the adjacent fixtures. When you come to the end of the screens, if you stop the row of lights, the screen will be lit by the fixture in front of it, but it's not going to get any additional light from adjacent bulbs because they're not there. Therefore, you have to extend the lighting five to 10 feet beyond the edge of the screen. If you don't have space for that, then place some vertical bulbs on stands for the edges of the screen. The distance of these bulbs [from the screen] should be at least one-half the height of the screen — no closer. If you have a 20' x 40'

screen, the rows of bulbs should be ten feet away. If you have a 30' x 60' screen, then the rows of bulbs should be no closer than 15' from the screen. Putting the rows of lights closer than half the height of the screen will result in the edges being brighter than the middle. Likewise, putting the rows further than half the height away will still yield even light, but it will be dimmer overall. I normally place the fluorescent banks five feet apart. But, in some cases, depending on the brightness you need and the film stock being used, you may only need two bulbs every eight to 10 feet apart.

"Once you get the screen evenly lit," he continues, "the next phase is to shoot an exposure wedge, normally bracketing the exposure from plus two stops to minus two stops in half-stop increments. When the film is then developed, the negative is read on the densitometer, giving a series of readings that relate to what normal, over- and underexposure is. From that data, you can then determine what exposure value [on

your meter] resulted in the aim density in the preferred color. This procedure calibrates your particular meter to that exact setup. I've found that when using very saturated pure sources, the exposure for a bluescreen is usually a stop to a stop and a third under the normal exposure, and for greenscreen approximately two-thirds of a stop under. But as the screen becomes less saturated, due to a less pure light source, you underexpose less — until you're at a situation of using white light to illuminate the screen, in which case you would expose the screen at normal, mid-gray value. This usually occurs when the actor is in contact with the surface of the screen — walking on it, sitting on it, or whatever — and you must light the screen with the same light illuminating the actor."

An important note about the use of meters to determine a blue- or greenscreen's brightness — especially bluescreens illuminated with blue-spiked, narrow-wavelength fluorescent bulbs, which produce wavelengths of

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around 420 nanometers — is that most conventional spot meters are not calibrated to read one limited wavelength of light, and can respond with radical results. A company called Zone 6 Studios offers a photocell modification in some meters that enables the meter to read accurately not only under white light, but under the full tonal range of each color wavelength. Many of the effects cinematographers working today swear by the conversion. Submits Schuman, "When you're reading pure blue wavelengths of light, it's not possible to make a blanket statement like, 'Always underexpose by one stop,' because it depends upon the meter that you're reading with, and you must shoot the production shot using the same meter with which you shoot your tests."

Once the background matte screen is illuminated, there is still the added technical and artistic headache of matching the foreground's illumination with that of the background plate to which it will eventually be married. Brevig illustrates, "Once you take out the color of the background screen, as you will do in the composite, if you don't have additional light that's lighting up the surfaces of the object in the same way it would be lit if it were actually in the background environment, then the edges of the foreground subject will be dark and look like a cut-out. When you're standing there on stage and you're staring into a blinding blue- or greenscreen, it's not going to look dark to your eye at all; but as soon as you filter out that color, if you don't pre-build in the amount of backlight or ambient room light that would be there, it's not going to look as believable as it should. What happens is that all of the edge light that you see on the object is going to go away — if you're lucky — when you filter out the color that you don't want."

"Let's pick the worst possible example," he expands. "Say you're compositing a man who's supposed to be standing out on the beach in daylight. So you run out to the beach and shoot a plate of the background. You measure it all out, you know where the camera

was, and then you go to the bluescreen stage. You stare at your guy there, and you know where the sun was, so you put the key light on him the same way. But if the man [at the real beach] was standing on the sand and the sand was lit by the sun, he'd have this fill light bouncing off this giant white sand surface — which is maybe within two stops of the sunlight — on all surfaces of him. If you didn't think of that later, and you just put him in front of blue velvet and then filtered out the blue, he would look like a man photographed outside at night in a black cave composited onto this beach scene. So you have to consider everything: 'Okay, he's there and he has all of this fill light bouncing from all of these different places. He's got the sun, which is a certain color from one direction; he's got all of the sky, which has a slightly blue cast to it from the top and the sides; and from the bottom and the sides he's getting the sand's reflected light from the sun.' You have to through the effort of re-creating all of this light with bounce cards or whatever you choose to light him with, so that when you take him out of this bluescreen environment, he's still got all of the lit-up surfaces he should have if you were really out there in the environment you're going to composite him into."

Adds Stump, "As the screens themselves have gotten more and more lightweight, and the lamps to illuminate them have become smaller and more lightweight, you can actually take the screens out on the set and light in the environment where the scene is taking place. If we're doing a two-character shot and we have the set in which the scene is suppose to take place, we'll rehearse the scene, light the scene just like a normal filmmaking exercise, and then pop in a screen, add the lights to it and just work in the normal lighting environment. Barring that option, your primary focus becomes to match the lighting of the scene, make the contrast of the foreground match whatever the background is, and make the direction, color and overall tone to match the plate. If I can get that ideal balance and make that matted object look

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as if it belongs in the set, then I've succeeded at doing blue- or greenscreen photography. The primary misconception I see all the time is not treating the screen and the foreground subject as two separate lighting exercises — in other words, keeping all of the light that is falling onto the subject off the screen, and keeping as much of the light that is lighting the screen as possible off the subject. The second most common error is the level at which you expose the screens. While we have several rules of thumb, the best rule is to take a piece of test film and let the compositors tell you where they like it the best. For example, there are some facilities that like a very hot greenscreen, and on occasion I have exposed bluescreens three stops under for some people who just asked for it that way."

"Nothing can beat good original stage photography," concludes Yeatman. "In years past, when we composited optically using a photochemical process, there were some really strict requirements and specific limitations in the setup and photography of traveling-matte composites. This was due primarily to the optical photographic process itself, and the limits inherent in that technology. Today, in a digital world, those limitations are greatly reduced, and the creative possibilities of traveling-matte photography are ever-increasing. This does not mean that there are no rules to be followed, or that 'anything goes' in the shooting of bluescreen and greenscreen elements. On the contrary, I feel that the process is, in many ways, more confusing and difficult than it has been [in the past]. In order to shoot the best film elements on sets, and be able to push the creative envelope, directors of photography should not only have an excellent knowledge of photography, but also an extensive understanding of the digital compositing process. They shouldn't rely on the concept that 'digital can fix anything.' Too much of today's digital technology is used to correct poorly shot material, rather than to push the creative envelope." ♦

Rumor has it that actor Peter Ustinov once likened metropolitan Toronto to New York City — if the latter city were under the management of a Swiss municipal government. Having enjoyed a liberal dose of Canadian hospitality during the 21st annual Toronto International Film Festival (held from September 4-15), this humble correspondent found that concept to be more than mere conjecture.

Serving as bookends to the festival, which boasted 272 films from 70 countries, were director Carroll Ballard's pastoral *Fly Away Home* and actor Tom Hanks' directorial debut, *That Thing You Do*. Besides Gala Events and Special Presentations, entries were organized in the categories of Contemporary World Cinema, Perspective Canada, Planet Africa (works from the black diaspora), Discovery (first-time filmmakers), Real to Reel (documentaries), Midnight Madness (eclectic genre fare), the Dialogue Series (in which filmmakers discussed a favorite work), the national cinema overview Vietnam: Then and Now, and a spotlight series on revered Portuguese auteur João César Monteiro.

From all of the films that an individual could feasibly view throughout the festival, the following three were selected for coverage in light of their outstanding cinematography.

The Pillow Book
(U.K./France/
Netherlands)

Director:
Peter Greenaway
Cinematographer:
Sacha Vierny

A thousand years ago during Japan's Heian Dynasty, Sei Shonagan penned a non-narrative diary of memoirs, manners, lists, quotations and romantic rendezvous. Taking its name and inspiration from this classic tome, British filmmaker Peter Greenaway's *The Pillow Book* tells the tale of Nagiko

A Cinematic Melting Pot

The Toronto International Film Festival offers a wide array of noteworthy works from all over the globe.

by Andrew O. Thompson



Kiohara (Vivian Wu), a calligrapher's daughter with a fetish for having her bare body written upon. To escape a tumultuous arranged marriage, Nagiko flees Japan for Hong Kong where, after some struggle, she assumes a thriving career as a fashion model.

Nagiko then proceeds to procure lovers with expertise in calligraphy. One such paramour, an English translator named Jerome (*Trainspotting*'s Ewan McGregor), convinces Nagiko that she should script his skin. But when Jerome offers his text and flesh to her father's former publisher, the linguist sparks the model's jealous rage. Nagiko's ensuing spite leads to unexpected tragedy.

The Pillow Book was filmed on

location in the Japanese city of Kyoto, Hong Kong, and in a studio in Luxembourg. Three specific shooting styles were devised by the director and septuagenarian cinema a to g r a p h e r Sacha Vierny, who has lent his eye to Greenaway's previous six features

(including *The Draughtsman's Contract*, *Belly of an Architect*, and *The Cook, The Thief, His Wife and Her Lover*) as well as numerous classics of the French New Wave period, most notably Alain Resnais' *Hiroshima, Mon Amour* and *Last Year at Marienbad*, and Luis Buñuel's *Belle de Jour*. [AC was unable to interview Vierny, who lives in seclusion on Belle Isle in the North Sea.]

Explaining the varied photographic aesthetics on display in *The Pillow Book*, Greenaway notes, "The Japanese footage is black-and-white, basically in the Cinemascope ratio. It's all taken from the position of about a meter and a half off the ground, from the sort of [perspective employed by Japanese directors] Ozu and

Top Left:
Festishistic fashion model Nagiko (Vivian Wu) puts a calligraphic pen to a suitor's skin in The Pillow Book.
Above: *The obstinate Bing Chan (Annie Yip) caught daydreaming during a Hong Kong meal in Floating Life.*
Left: *Eighteenth-century engineer Ponclendud de Malavoy (Charles Berling) toils over his dam designs by candlelight in Ridicule.*

Mizoguchi — the eyeline of a kneeling figure sitting on a tatami mat. All of the emotions are very suppressed, and there's little physical movement. The second style [of photography] is very brilliantly colored and related to the Hong Kong, kung fu-type movies, where things happen which are not explained in terms of light and action. The third [technique] is a post-cinema vérité, Nouvelle Vague, *NYPD Blue*-style jumpy handheld camera, which I suppose relates to shooting in a documentary fashion on streets anywhere in the world."

Because the use of 35mm cameras is banned on the streets of Hong Kong, two days' worth of exteriors had to be captured on the fly and out of sight of local authorities. According to Dutch gaffer Rene Van Brumlin, the production's only aids in this natural lighting situation were 250-watt battery

lights and high-speed Cooke lenses.

Filming in Kyoto's Bisshamon-do and Nin-na-ji temples for re-creations of the Heian period (1000 A.D.) was officially sanctioned by authorities, but not without its problems. The shrines' sacred nature meant that the crew's movements were severely restricted; they had to delicately place 10Ks and Mini-Brutes, complimented by such smaller (interior) units as 500-watt and 1K Fresnels. (Van Brumlin says that Vierny prefers tungsten lights due to their warm color and low cost.) Additional complications arose when no dimmers could be found in all of Japan.

The Luxembourg studio doubled as Nagiko's apartment and a Hong Kong hipster haunt called the Cafe Typo. The set itself was rigged with grids that held multiple 10Ks on a computerized dimming system. Both locales had Japanese calligraphy rear-projected on its walls, and thus often called for lower wattage frontal illumination so as not to overpower the effect. The text was projected via two methods: by theatrical spotlights with characters cut into Gobo templates; and via 18cm x 18cm slides shining through an Austrian Pani theatrical projector with a dimmable 5K fixture.

In keeping with the iconoclastic Greenaway's painterly directorial hand, the film was fashioned with multiple frames within the main frame, and variable aspect ratios which alter according to the intensity of the action onscreen. In a series of sequences that take the viewer from Hong Kong to Japan and back to Hong Kong again, flame imagery signals the shift from black-and-white to color footage, and vice versa. Details the director, "The first fire sequence deals with the burning of some diaries. We've tried very hard to make it deeply self-reflexive, so that when the diaries burn they do so in correspondence to the drama of the domestic quarrel — the burning of the relationship between man and wife. But also there's the notion that the screen itself is burning. When a frame is jammed in the projector gate, the frame burns. So

there are three things working together on different levels: the notion of the narrative burning in terms of the relationship of the people; the physical burning of the drawings and calligraphy inside the diary; and [burning of] the screen itself.

"[We also built up] the drama between the two protagonists by starting their actual narrative as a very small frame, which gets bigger and bigger — literally — as the domestic quarrel heats up. Finally, the quarrel heats up and the screen bursts into [full] frame."

The Pillow Book was shot with an Arriflex BL-IV in the Super 35 format. The footage (Kodak 5296, 97 and 98 stocks were employed) was then transferred to digital files for cutting on an Avid. Greenaway, who spent 11 years toiling as a film editor for England's Central Office of Information, found the non-linear system indispensable. With the mere touch of a keypad, for instance, he assigned full-screen blue and amber tinting to the monochrome Japanese footage to convey the emotional states of rejection and acceptance, respectively. But the director is no stranger to emerging video and computer technologies, having used Quantel's Paintbox in tandem with high-definition video to superimpose images and text onscreen for 1991's *Prospero's Books*.

While painting remains Greenaway's first love, the director is of the mind that digital cinema technology may bring him full circle in the artistic process. He plans to fully exploit computer techniques on his upcoming project, *The Tulse Luper Suitcase*, which will be simultaneously released as a feature, TV mini-series, CD-ROM, and Internet attraction.

Floating Life (Australia)
Director: Clara Law
Cinematographer:
Dion Beebe, ACS

Floating Life examines a fractured family of Hong Kong Chinese struggling with personal detachment and cultural conflicts. Mom and Pop Chan and teenage sons Chau and Yue emigrate to

The festival's various juries bestowed the following honors:

METRO MEDIA AWARD

- Shine* (dir: Scott Hicks, Australia/U.K.)
Second Place: *Breaking the Waves*
(dir: Lars Von Trier, Denmark/France)
Third Place: *Michael Collins*
(dir: Neil Jordan, Ireland)

INTERNATIONAL FILM CRITICS AWARD

- Life* (dir: Lawrence Johnston, Australia)
Special Mention: *Daytrippers*
(dir: Greg Mottola, U.S.)

NATIONAL FILM BOARD — JOHN SPOTON AWARD FOR BEST CANADIAN SHORT FILM

- Letters from Home* (dir: Mike Holboom)
Special Jury Citation: *Sin Cycle*
(dir: Ben Famiglietti and Jack Cocker);
Lodela (dir: Philipe Baylaucq)

TORONTO CITY AWARD FOR BEST CANADIAN FEATURE FILM

- Long Day's Journey into Night*
(dir: David Wellington)
Special Jury Citation: *Kissed*
(dir: Lynne Stopkewich)

AIR CANADA'S PEOPLE CHOICE AWARD

- Shine* (dir: Scott Hicks, Australia/U.K.)
Second Place: *Beautiful Thing*
(dir: Hettie Macdonald, U.K.)
Third Place (tie): *Fire* (dir: Deepa Mehta, Canada); *Fly Away Home*
(dir: Carroll Ballard, U.S.)

Australia to join their youngest daughter Bing, a stress case obsessed with assimilating into mainstream society. Meanwhile, the clan's eldest daughter, Yen, resides in Munich with her German husband and biracial child. Oldest son Gar Ming remains in Hong Kong awaiting arrival of his immigration papers. The narrative flips from one nation to the next as each relative contemplates issues of heritage and unfamiliar environments.

Director Clara Law (*Farewell China*, *Temptation of a Monk*, *Autumn Moon*) long ago reconciled her own sense of alienation and accepted her dual consciousness. Born in Macau, Law was reared by a traditional Chinese family in Hong Kong. Most of her elementary schooling occurred in Anglo-Chinese environments; Law also majored in English Literature at the University of Hong Kong.

This formal education, however, was scant preparation for Law's 1982 arrival in London, England for a three-year stint at the National Film and Television School. As she recollects, "I found myself in a total state of culture shock for the first six months. I thought I knew Western culture quite well, but I was a total alien—outside and unconnected. Since then I've been trying to find out who I am by reading up on Chinese philosophy and culture. When we started working on the story [for *Floating Life*], I felt a bit more settled. Yes, I have both cultures in me, but so what: I'm richer for it. I don't have to reject either one."

That melding of East and West is also reflected in her choosing to collaborate with director of photography Dion Beebe, ACS, a 1990 graduate of the Australian Film, Television and Radio School. His credits include Alison Maclean's *Crush* (1991) and Australia's segment (directed by George Miller) of the *One Hundred Years of Cinema* documentary. Beebe recently earned an Australian Film Institute nomination for Best Feature Film Cinematography for his work on (Australian) John Hughes' *What I Have Written*, which was partially shot in desaturated stills that evoke Chris Marker's *La Jetee*.

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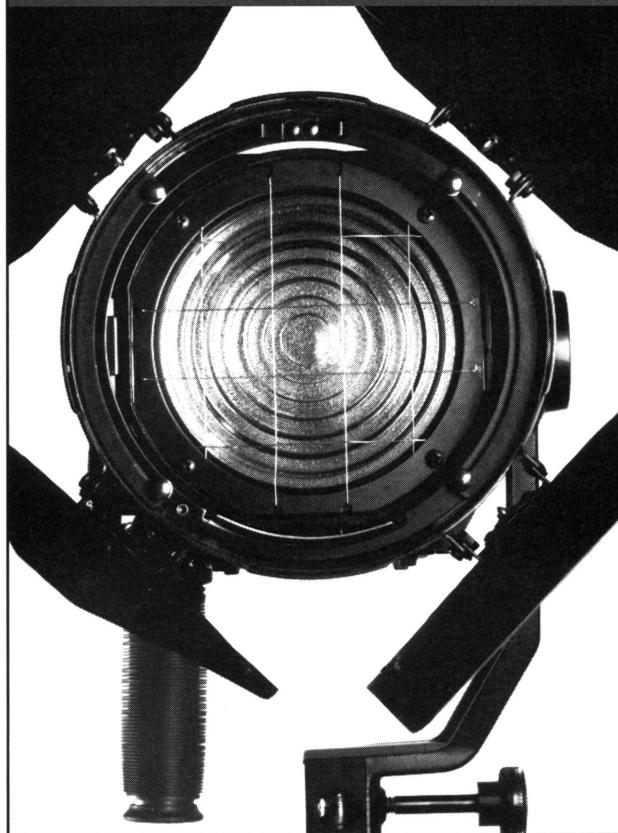
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The initial visual cues for *Floating Life* were painters Edward Hopper and Jeffrey Smart's stark scenes of dislocation. Law, however, also wanted to convey her less-is-more approach to Beebe, so she presented the cinematographer with a rather esoteric portrait of a shrimp (executed by Chinese artist Qi Pak Shek).

Though the picture initially puzzled Beebe, it jarred him out of thinking in a strictly Western mode. Recalls the cinematographer, "That kind of [artistic] abstraction was hard to define in a photographic sense, but it became a reference [which reminded me] that an ancient Chinese philosophy and culture was behind this contemporary story set in a Western landscape."

Adds Beebe, "Clara has a very Eastern directorial style. I define that approach as observational: you sit back and things happen and you watch them. Western films get in there, follow the action and almost force it upon the characters. Clara would never follow an actor; she lets the action take place within his frame. That's very much in line with [Japanese filmmaker] Ozu, who was famous for locked-off setups on a 50mm lens. We didn't quite go that far, but there did tend to be a lot of static setups that watched the action taking place."

Law and her husband/writing partner Eddie relocated to Melbourne, Australia a few years ago, so the director had firsthand knowledge of how brilliant that nation's vistas should appear to the eyes of the recently emigrated Chan family. Says the director, "I wanted to capture that glaring high-contrast sunlight that is very telling of Australia. I also tried to use the primary colors of nature, so sky blue was really blue, and the green of the trees was extremely green. I wanted the inside of the house to be beige, monotonous and mechanical, like the totally sterile environment which Bing is trying to create for herself."

Explains Beebe, "We set out to achieve a lot of overexposure within the frame, very burnt landscapes—not sunburnt in warm orange tones, but a harsh, white

light. I found that [Kodak] 5245 could be pushed 2.5 stops over to get that blown-out effect. Still, I was able to hold onto quite a lot of the detail—colors where we had them in the sky, and within the frame."

To re-create that glaring sunlight inside the house, Beebe aimed fixtures directly through its windows. This did lead to concerns in regard to shadow contrast on the ivory interior walls. "With the references to Jeffrey Smart and Edward Hopper, a strong single source was part of the approach," says the cinematographer. "I constantly had 12Ks establishing a source light hitting walls and creating shapes. Supplementing that were 4K Pars and a lot of bounce light inside to bring those shadow areas up a bit. But still, the contrast helped to create some sense of composition in the house's interiors, which tended to have white walls with a very new feel."

Having primarily employed Kodak's 5248 or 5293 stocks for interiors in the past, Beebe found it necessary to compensate for the 45°'s lesser latitude on these scenes. He expounds, "The shadow areas that seemed to be well-exposed were not coming out at all. I had to constantly supplement, and push light into shadow areas in order to create a balance with the interiors—not be too hard and contrasty, yet maintaining a continuity with the bright, burnt out exteriors. It was a matter of retraining my eye to read the contrast levels of the interiors."

Hong Kong's aura was saturated with a yellow tint that suggested a smoke-smirched varnish resulting from years of urban encroachment. Beebe shot these sequences with an Arriflex 535 and Zeiss lenses. He chose Kodak's 5293 stock for its wide latitude, which permitted the use of streetside neon fixtures as practicals. Beebe tended to mix and match practical and tungsten sources in interiors, and domestic fluorescents were left uncorrected for the dirty green illumination that they cast. A controlled smoke level was reached on set with burning joss sticks (thick, two- to three-foot incense sticks used in Chinese prayer rituals).

ZGC for Cooke

Says Beebe, "I tended to shoot a lot of [that footage] either uncorrected or combining 85s with tungsten to get a slightly warm tone, mixing the daylight fluorescents within to keep [the scene] quite dirty. I also introduced a slight yellow tone in the timing to give that wash across the mix of colors within the frame. It's almost like the smoke has settled over the whole plane and stained it slightly."

For the German segment, three days' worth of exteriors were filmed in Munich in late November 1995. That time of year is Australian summer, however, which caused the filmmakers some complicated matching problems. (Some earlier footage had been shot with Sydney doubling for Munich.) To imply a wintry atmosphere in Sydney, Kodak's low-contrast 5287 stock was coupled with 81-EF filters which Beebe says "introduced the blue cast without it being completely uncorrected as it then tends to go quite blue. We tested that but it felt too affected. The 81 warmed it up slightly and kept the blue tone."

Beebe insisted that a silent confrontation between a skinhead and Yen (Annette Shun Wah) be shot either at twilight or pre-dawn — the two times when the Australian sun is at its dimmest. But even at four in the morning the natural illumination proved too radiant to pass for that of Munich.

Commenting on the filters placed on the Arri BL-IV utilized on this scene, Beebe says, "I was shooting with combinations of polarizers, straight ND-9s and ND-6s and hard-edged ND grads to try to pull the stock down to an f2.8. The sun there is so sharp that we were shooting through five filters just to keep it soft and shallow."

Ridicule (France)
Director: Patrice Leconte
Cinematographer:
Thierry Arbogast, AFC

For those navigating the turbulent social waters of the 18th-century French aristocracy, proper etiquette entailed a rapier-like wit and a predilection for humiliating bon mots. In *Ridicule*, this peculiar custom is an obstacle that must be

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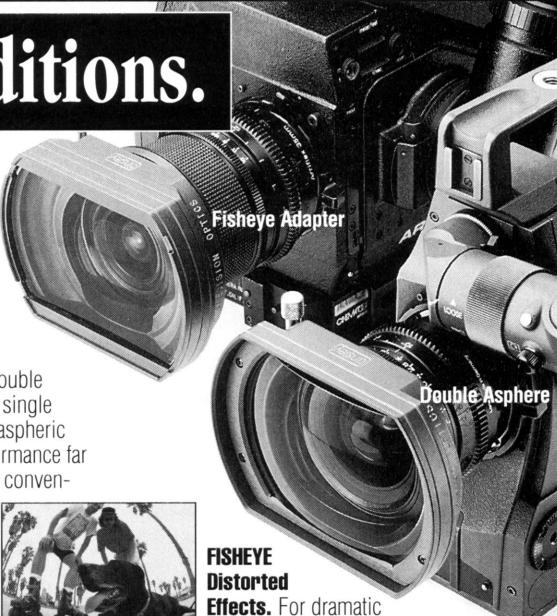


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surmounted by an engineer named Ponceludon de Malavoy (Charles Berling), who seeks an audience with King Louis XVI regarding plans to dam a river in the Dombes, the mosquito-infested, quagmire which Malavoy calls home. Compounding this already taxing ordeal are his attempts to elude Madame de Blayac (Fanny Ardant), a scheming, lascivious countess.

The director of *Ridicule*, Parisian native Patrice Leconte (*Monsieur Hire*, *The Hairdresser's Husband*) sought a look that would counter the heavily diffused, soft-lit veneer so prevalent in films depicting this historical period. Notes Leconte, "I adopted an attitude that the atmosphere should be harsh on the eye. I refused to go the Louvre, for example, because I didn't want to create a cultivated feeling of that epoch, like a painting in a museum. Essentially, I wanted one to forget that the story was set in the 18th Century."

Toward that end, Leconte sought out French cinematographer Thierry Arbogast, AFC, out of an appreciation for the slick, modern imagery the latter has lent to the films of director Luc Besson (*La Femme Nikita*, *The Professional* and next summer's *The Fifth Element*). Arbogast relished Leconte's stylistic challenge, particularly as one of his recent projects (Jean Paul Rappeneau's *The Horseman on the Roof*) was a period film photographed in the traditional sense.

After issuing a decree that the lighting should be "uncultivated," Leconte impressed upon the cinematographer that the ambience of *Ridicule* should still mimic the 18th Century's reliance upon natural light. Explains the director, "We worked with natural light, but made a point of exaggerating the fact that it was natural. I wanted very marked contrast between light and dark, by having almost blinding light with very dark shadows. For example, there's one scene in which an old person is sitting on a couch and almost all the shutters are closed. The only point where light actually comes into the chamber is an area where the shutters are slightly open. I told Thierry that I wanted that strip of light to be so intense that it would seem

like a laser beam, as if someone could almost burn themselves by walking into it. It gave a threatening effect, and even though it was dramatic in that sense, it was still natural light."

Most of *Ridicule* was filmed on location in some six castles near Paris. In order to maintain consistency in the lighting, the feature's few studio scenes were filmed on sets with their ceilings attached — even when the roof was not in the frame. The film was shot with a Panaflex Platinum camera (a G-II was used for handheld shots) entirely on Kodak stock: all exteriors were done on 5245, while daytime interiors were executed on 97, nighttime exteriors on 98 and additional sequences on 93 and 47.

The diverse array of stocks conformed to Arbogast's general philosophy that film photography be somewhat diverse. Notes the cinematographer, "I'm not very concerned with continuity; I like the images to clash against one another. [On *Ridicule*], I mixed stocks more for practical reasons. If, for example, I'm in a room in a castle with daylight coming from outside, instead of placing a filter on the camera or [special material] on the windows, I'd rather shoot daylight at 250 ASA [on 5297]. Outside I used 45 because it's 50 ASA and is very beautiful in the sunlight."

Some of the daytime interiors of Versailles required that the cinematographer simulate the sunlight streaming into windows via artificial fixtures. Around the castles, for example, 18K units were placed at erratic distances to lend realism to the incoming illumination. Arbogast expands, "Sometimes we went very close with a lot of diffusion over the source, and at other times we went further away and harsher. I would even go to extremes and have all of the sources coming from outside, with none inside. We added smoke to make the light more manageable and to give the look some texture."

Arbogast says that his cinematographic cues for night interiors came from John Alcott, BSC's Academy Award-winning work on Stanley Kubrick's *Barry Lyndon* (see AC March '76). Like Alcott,

Arbogast shot such scenes almost entirely with real candlelight, but he had the advantage of using faster modern film stocks. (Small fixtures were occasionally hidden on-set, since the film's widescreen framing would have squeezed images of the candles had there been too many of them within the shot.)

The cinematographer selected Primo anamorphic lenses to further the realistic, contrasty appearance of the lighting. Though Leconte prefers the scope of the 2.35:1 format, and employs it on all of his films, the director didn't use it to highlight the opulence of Versailles in the 1700s. Leconte notes, "Since I wasn't making a documentary about the 18th Century, I wasn't concerned with encapsulating all of the aspects of the decor. There are a lot of tight shots in the film that required the use of long focal lengths; from time to time, we used short focal lengths for a grand vantage point. I don't like using mid-range focal lengths because their perspective is too much like the human eye."

The anamorphic format proved tricky during the penultimate scene of *Ridicule*, a costume ball during which a dancing Malavoy is intentionally tripped by one of de Blayac's allies and tumbles to the dance floor in full view of the entire crowd. The engineer rises above the public humiliation and, much to the haughty aristocrats' bemusement, declares pride at his peasant heritage.

Notes Arbogast, "What was complicated about the ballroom scene is that I wanted to do wide shots. The room was oval with mirrors all over, and a high ceiling from which you couldn't hang any bars. So what we did was to float two six-foot-wide [5K tungsten] helium lighting balloons, placing a skirt of light Duvateen all around them so the light wouldn't spill everywhere. I then added top light, positioned large candles all around the room and bounced a little bit of reflective light." ♦

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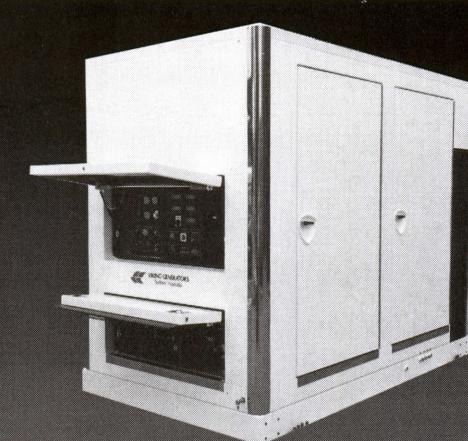


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Joseph August, ASC's Swan Song: *Portrait of Jennie*

The great cinematographer's final film remains a testament to his artistry and technical expertise.

by Jan Alan Henderson

Unrequited love and the supernatural have been favorite topics of filmmakers since the dawn of cinema. When a film focuses upon the supernatural, most often man is pitted against evil forces. One exception is David O. Selznick's 1949 production of *Portrait of Jennie*, the last film he produced at his Culver City studio and the final feature in the repertoire of cinematographer Joseph August, ASC.

In 1944, Selznick paid \$15,000 for the screen rights to Robert Nathan's haunting novella of the same title, which he had read several years earlier. The offbeat story starts in 1934 with struggling New York artist Eben Adams meeting a little girl named

Jennie in Central Park. She claims that her parents were entertainers at Hammerstein's Music Hall, which was torn down many years before. Eben sketches Jennie, but she is elusive, often disappearing and returning without a moment's no-



tice. Each time Jennie reappears she is a little older, and as she blossoms into womanhood Eben falls in love with her. Trying to keep their love alive, the amorous couple resist the forces of time and the social conventions of the real world. But as fate ordains, the woman is swept away in a hurricane off Cape Cod. Ironically, Eben's portrait of Jennie makes him a famous artist.

The title of Nathan's tome is what drew Selznick to the property in the first place. A member of his staff suggested that he cast Shirley Temple and shoot the film over a span of years to take advantage of her journey into womanhood. The producer, however, believed that *Portrait of Jennie* would be a perfect vehicle for his discovery, the former Phyllis Isley, whom he had renamed Jennifer Jones. In 1939, as Isley, she had appeared in a John Wayne Western and the serial *Dick Tracy's G-Men*. That same year, she married

actor Robert Walker. Three years later, under a Selznick contract, she embarked on a successful career that included earning a 1943 Best Actress Academy Award for *The Song of Bernadette* and nominations for *Love Letters* in 1945, *Duel in the Sun* in 1946 and *Love Is a Many Splendored Thing* in 1955.

The actress and Selznick began a romantic relationship in 1945, after she had divorced Walker and the renowned producer had separated from his wife, Irene. The popular belief was that *Portrait of Jennie* was Selznick's love letter to Jennifer. Their relationship had a rocky start, and the film was meant to bolster her career after the disappointing critical

and financial showing of Selznick's epic Western, *Duel in the Sun*.



By the summer of 1946, Selznick was deeply engrossed in the preproduction of *Jennie*. He first contacted author Robert Nathan to write the screenplay; the meeting is said to have been a disaster. Next, he met with fantasy writer Mildred Cram, who had written *Forever*, a story resembling *Jennie*. Her suggestions called for a more grandiose approach, one that Selznick felt would confuse his audience and raise the budget. He then called in S. N. Behrman, who rejected the job, saying he deplored fantasy stories. Finally the piece was given to Peter Berneis, a young writer who managed to extract a script close to the novella, and which Selznick considered to be a rough draft.

Mounting problems with Selznick's distributor, United Artists, censorship hassles over *Duel in the Sun*, and production of Alfred Hitchcock's *The Paradine Case* interrupted the scripting of *Jennie*. A survey showed that Gregory Peck would be the popular choice to play opposite Jones, but Peck was committed to a project at Twentieth Century-Fox. Cast as Eben Adams was Joseph Cotten, who bested Laurence

Above left:
Robert
Brackman's
portrait of
Jennie. At right:
The live Jennie,
embodied by
Jennifer Jones.

In a frame from the movie, artist Eben Adams (Joseph Cotten) enjoys the company of model Jennie in his tiny studio.



Olivier for the role.

Selznick had confidence in the box-office appeal of Jones and Cotten, since he had loaned them to Paramount for the successful 1945 production *Love Letters*. That subtle mystery, masterfully directed by William Dieterle and boasting a screenplay by Ayn Rand from Chris Massie's novel, surpasses *Jennie* in many ways. Selznick also acquired Dieterle for *Jennie* because he worked well with Cotten and Jones.

Dieterle was born to peasant parents in 1893 in Rheinpfalz, Germany. He began staging amateur plays with village children when he was 10. After receiving a brief education, he took up the trade of carpenter and glazier. This led to work in minor theatrical productions and ultimately on larger stages in Zurich, Munich and Heidelberg. By 1918 he was working with Max Reinhardt in Berlin and acting in modern and classical productions. He made his screen debut in 1921, and by 1926 he was a film producer. Dieterle had a contract with Universal Pictures' German division, and when this ran out he emigrated to the United States and won a contract with Warner Bros. to direct and act in German-language versions of their productions.

Dieterle's work as director/star of the German-language version of *Moby Dick* led to a contract to direct English-language Warners films, including *The Last Flight*, *Jewel Robbery* and *The Crash*. Later, for RKO Radio, he made the excellent *Hunchback of Notre Dame* (1939) and *All That Money Can Buy* (1941).

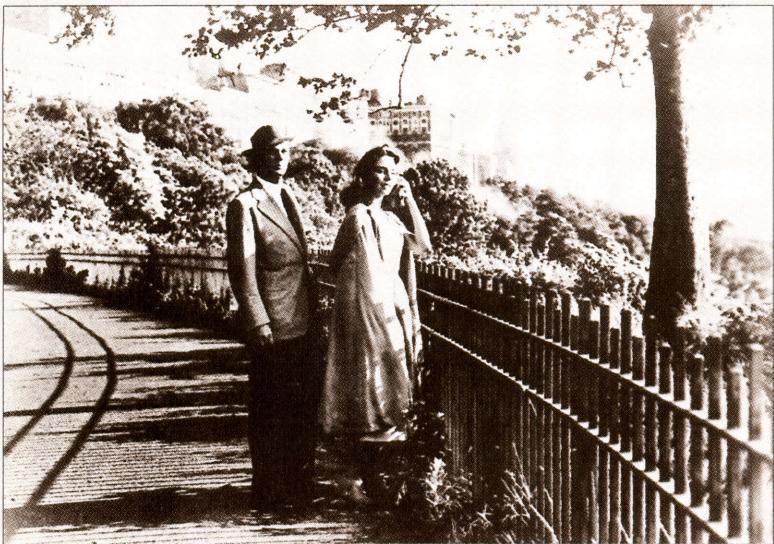
To photograph *Jennie*, Selznick selected veteran cinematographer Joseph August. Born on April 26, 1890 in Idaho Springs, Colorado, he became an as-

sistant cameraman for Thomas Ince at Inceville Studios in Santa Monica in 1911. Within a year, he progressed to first cameraman. August generally got along with Ince, but on one occasion when Ince was kidding him the situation got out of hand and the two came to blows.

Ince once challenged August's special effects expertise by asking him to turn a horse into a cow on film. August spent a sleepless night devising the shot, and his ruminating led him to experiment with miniatures. In another experiment, he photographed a miniature boat floating across a pond using a string guidance system. This was in the pre-rushes days, and August took his shot directly from the lab to a Santa Monica theater and had the projectionist splice it into a short subject at the end of the program. The audience was enthralled, but at the end of the clip a huge cow's face pushed into the frame and took a drink from the man-made lake.

In 1914, William S. Hart came to Inceville, and August was called in to complete a film Hart had in production. He remained with Hart as director of photography for 58 more pictures, almost the entire Hart catalogue. August was one of the original 14 founding members of the ASC in 1919, and he and Charles Rosher were the first cinematographers to have ASC after their names on the credit titles.

In the March 1939 issue of *American Cinematographer*, August was profiled after being awarded the *Hollywood Reporter* Critics Choice award for his stunning work on *Gunga Din*. Writer George Blaisdell found that August had unorthodox ideas, one being his aversion to light meters. "Don't get me wrong on



Above: New York City is one of the stars of *Jennie*, as evidenced by this frame enlargement. **Right:** Eben breaks bread with a Manhattan cabbie (David Wayne in a memorable turn).

that," August said. "I'm not against meters, by any means. They just don't fit into my plan of taking pictures. The meters I lean on are my eyes. When I first started in this business 28 years ago, I had a preceptor [teacher] I then thought sort of tough — tough because he was insistent on my learning what could be accomplished with a pair of eyes. [He was] a man with scant patience for any devices that aimed to make those organs secondary to any human invention.

"Then again, I frequently choose to make an exposure — we will call it an unorthodox exposure, one [intended] to produce a certain effect that may be desirable. For instance, the negative might be overexposed and underdeveloped — or the procedure might be reversed. Of course, it would be necessary to tip off the laboratory, in which a cameraman could take what some might consider liberties these days.

"I recall that same preceptor of mine down at Inceville in the beginning. There was a device at that time designed to obtain for the cameraman something parallel to what a meter would provide today. I was told with considerable detail and even more emphasis just what fate would befall me if he ever found me fussing with one of those gadgets. Yes, it was known as the illumination system. It was just after this that I began seriously to cultivate attention to my eyes with the object of learning as much as possible of what I could accumulate in the way of optical knowledge...

"Many things have changed... but the basis of lighting seems to be about the same as at the beginning. Even with the present era of fast film [by modern standards, of course, film was very slow in 1938] it remains practically unchanged. I have at home a photograph of a set I worked on in 1913 which seems basically about what we are doing today."

When he was shooting Hart's pictures, August used an average of 14 lights, powered by a 500-amp generator. During production of *Gunga Din*



(1939), he was lighting a 600' x 1750' set with the help of a 12,000-amp generator. On Republic's *Man of Conquest* (also 1939) he was approached by an actor who was concerned about shooting outdoors late in the day. "I've worked in a hundred or more of these pictures and I've seen crews pack up when there was a lot more light than this," the actor said. "Now this scene means a lot to me and I'm plenty concerned that it is all right... If it is, there'll be a case of Scotch waiting for you at your home tomorrow night." August told him to "take a squint at the dailies tomorrow." The case of Scotch arrived the following afternoon.

Convinced that his team could make *Jennie* a reality, Selznick sent Dieterle, August, and newly hired line producer David Hempstead to Manhattan to take advantage of leftover snow from the blizzard of 1947. Selznick was constantly rereading the story and gleaning new meanings each time. He had Leonardo Bercovici prepare an adaptation, but even as principal photography began, Selznick was continuously rewriting and reshaping the story.

The rushes Selznick received from Manhattan were far from what he had envisioned. His co-stars looked,

he said, "twice their actual age." August had his hands full with the frigid conditions in Central Park. However, he managed to solve the aging problem, and add a surreal atmosphere to the shots, by having his antique reducing lenses, which he had used at Inceville, shipped from California.

Selznick was constantly bombarding Hempstead with wires containing his distinctive memos, critiques and demands. Hempstead, who already had a predisposition to heavy drinking, began to come apart under Selznick's needling, and crawled back to the bottle. A young assistant, Arthur Fellows, was sent by Selznick to pick up the slack so that production could resume. [Fellows later worked with Joseph August Jr. on the popular '60s TV drama *The Fugitive*.] Selznick soon relocated to New York to personally supervise production.

In his 1989 autobiography, *Vanity Will Get You Somewhere*, Joseph Cotten described his adventures with Selznick, August and Dieterle thusly: "One day when Jennifer Jones and I were shooting some of his Currier and Ives shots on the frozen lake in Central Park, David came stumbling onto the ice, excitedly shouting, 'Stop, stop, I have reread the book and I now understand it!' This alarming statement snapped us all out of our dream world. 'The special effects department in Hollywood can make it look much more real,' David said. 'Shoot the scene with Jennifer and Joe on the bench, with a swan swimming in the background,

then wrap it up, and we'll finish the job in California.'

"Joe August was the last to leave; he found it hard to part from the beauty of nature, but professional that he was, he did as his producer bade him. We all laughed and called it the 'swan song scene.' Jennifer and I were seated on the bench. In the background was the frozen lake. The crew had broken the ice, leaving enough room for the swan's activity.

"At that point, Joe August announced that it was impossible to proceed. The motors of the camera had frozen and refused to turn, and the faces of the actors were blue from the cold and quite expressionless. Runners were sent to purchase electric blankets, two of which comforted the camera. Another pair were painted to match the seat on the bench and were used to defrost the seats of the actors.

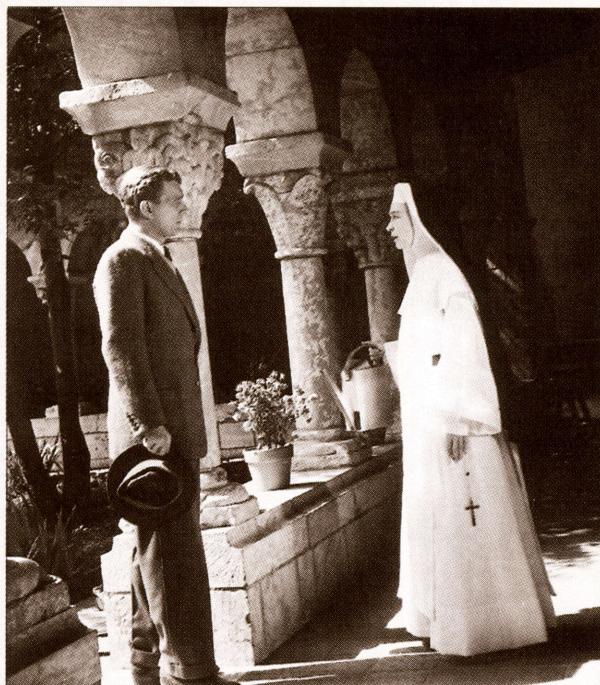
"Action. 'Cut,' said Joe August, 'the swan went out of the shot.' Several rowboats were dispatched to discourage the swan from wandering. Action. 'Cut,' said a voice. It was the animal technician, who said, 'That swan is being harassed by the men in those boats. The SPCA will have us up on charges for this.' Dieterle explained that what we wanted was the swan to be seen swimming in the background. 'Simple,' said the animal technician. 'How deep is the water where we want the swan?'

"How deep is the water where we want the swan?" cried three assistants to the men in the boats. "How do we know how deep the water is?" cried the men in the boats. Several measuring devices were sent out. 'Ten feet,' yelled boatman number one. 'Ten feet,' yelled boatman number two. 'Ten feet it is, plus enough for the circle,' said the animal technician, as he carefully measured out a length of rope. He tied the swan's foot to one end of the rope and a heavy rock to the other. He dropped the rock into the water. . . [and] the swan glided in a little circle just inside the borders of the shot.

"The swan circled in the background, but each time the circle was smaller. The animal technician was unaware that the bottom of the lake was a quick-sand of decomposed plant life and that the rock was sinking into it. The swan's circle became smaller and smaller, and his neck was struggling to stretch above the water, when from behind the camera Joe August shouted, 'Save the swan!' One of the boatmen reached it just in time."

Earlier, the company had worked at Graves End Light, a lighthouse off Boston which offered, as Cotten recalled, "real waves, real fog, real wind, real water, and a great iron ladder leading to the top of the lighthouse, with real ice surrounding every single rung. Most of the time we were too sick and too cold to eat the real lobster dinner that the crew of one of our tug boats served to us after they had robbed the nearby traps.

"It had all been terribly real and extremely uncomfortable. David's sudden comprehension of the story, and his decision to return to Hollywood and remake everything he didn't like, was most welcomed by Jennifer and me; by some of the crew, if not all of them; and by a dazed and delighted cameraman. August had worked with David before, and their tastes



Eben's search
for truth leads
him to Mother
Mary of Mercy
(Lillian Gish).

and artistry were similar."

Before August left Manhattan, he gave Ezra Goodman an exclusive interview for the *New York Times*, titled "Closeup of a Cameraman." He noted, "Shooting a picture was a lot more informal, a lot more fun — and a lot more dangerous — in earlier years. Today I have the title of Director of Cinematography and a camera crew of four. In the old days I used to crank the camera myself.

"I can remember shooting William S. Hart in action on a horse by riding alongside him on another horse with my camera propped up in my lap. For one silent picture, I was perched high up on the edge of a ship's mast, grinding away at the camera and rocking it for the right effect. A tugboat was shooting water up at me for a storm scene, and I almost fell off when a stream of water caught me unawares. My assistant grabbed me just in time. I always had a man standing by to cover me during the early pictures I shot since I had to keep my eyes glued to the camera no matter what was going on around me."

In the same interview, August told a story working on John Ford's *Men Without Women*, for which he had donned a diving suit and submerged on the bow of a submarine in order to photograph both above and below water. He also recalled lying strapped to the bows of PT boats speeding past real explosions while filming *They Were Expendable*. (August had also served in Ford's OSS Unit in World War II, and was wounded while photographing *The Battle of Midway*.)

After returning to Selznick Studio, on the RKO-Pathe lot in Culver City, the cast and crew of *Jennie* faced the task of replicating a giant tidal wave on the soundstages. The effects team included August's colleague at Inceville, Paul Eagler, ASC; designer J. McMillan Johnson; optical camera wizard Clarence Slifer, ASC; practical effects man Russell

Cecil Kellaway
and Ethel
Barrymore have
prominent
roles.



Shearman; and cameraman Harry Wolf (later ASC).

Aside from the storm sequence, the film offered an abundance of other special effects. August's halo-effects shots from Manhattan (of Jones as a young Jennie) remained. Much New York footage was mixed with new scenes, and numerous matte shots were made. Tapestry effects were achieved through optical printing of the Central Park footage. Transparency projection was employed for the skating scenes, the New York skyline outside the artist's loft, a cab ride in Central Park, scenes overlooking the Hudson River, and an early morning Fifth Avenue shot. But the tidal wave at the picture's climax remains one the most exciting effects sequences ever attempted.

The storm was a production unto itself, mixing the effects from the first two-thirds of the picture into the maelstrom. The final sequence, in which Cotten meets Jones at the lighthouse, utilizes several sizes of miniature boats and lighthouses. Scale was determined by the quantity of water used in the shots. Custom-designed water tanks were required for both the lifesize and miniature effects. Rear-screen projection was heavily employed in the full-scale and miniature shots to create the illusion of an East Coast hurricane. For the film's original release, the storm was tinted green and the image widened to double size. For the transition from the green tint to black-and-white, sepiatone stock was used. Prints that survive today are minus the sepiatone footage. Soundmen Charles Freeman and James G. Stewart used a combination of recordings of an earthquake, thunder, Niagara Falls and an oversized blowtorch to create an awesome sense of reality.

The brief scene featuring the actual portrait of Jennie, painted by Florida artist Robert Brackman, was shot in Technicolor and spliced into the release prints.

On September 25, 1947, tragedy struck the production company when Joseph August died in

Selznick's office after toiling on the immense tidal wave sequence. Joseph Cotten described the cinematographer's demise: "Joe August, our brilliant, incomparable cameraman, our master of ethereal light, as much our inspiration as anyone, walked into David's office and said, 'I think it's finished now. I'm satisfied.' He went over to the sofa, lay down, and with a hauntingly beautiful smile, closed his eyes and never opened them again."

Jennie was August's 227th production. He was only 57 when he passed away.

Lee Garmes, ASC photographed the few remaining scenes. Selznick then took *Jennie* into postproduction. However, his long-time editor, Hal Kern, had tired of Selznick's indecisive ways and decided one Saturday afternoon to visit the racetrack — the very day that Selznick was planning to screen rushes for Mary Pickford. Selznick fired Kern and, by his own admission, came to regret the action.

The producer hired Dimitri Tiomkin — a surprising choice for a gentle fantasy — to prepare the musical score. Tiomkin, more often a demonstrative composer, provided a subtle score based on his orchestral arrangements of Debussy piano preludes, using "The Maid With the Flaxen Hair" as the main theme. Postproduction dragged on, and the picture was not released to the public until March 29, 1949.

Portrait of Jennie won the Academy Award for special effects, and August received a posthumous nomination. Although the picture was not a financial success and has obvious continuity problems, it has become a minor classic for romantic/fantasy film lovers, in large part due to its sensitive cinematography.

Two months after its release, Selznick married his real-life Jennie in Italy. He remained with her until his death on June 22, 1965. ♦

Credits

A Selznick-International picture; produced by David O. Selznick; directed by William Dieterle; associate producer, David Hempstead; screenplay by Paul Osborne and Peter Berneis, from the story by Robert Nathan; adaptation, Leonardo Bercovici; director of photography, Joseph August, ASC; Music composed and conducted by Dimitri Tiomkin, adapted from themes by Claude Debussy; production design, J. MacMillan Johnson; art director, Joseph B. Platt; set decorations, Claude Carpenter; portrait painted by Robert Brackman; edited by William Morgan; special effects director, Clarence B. Slifer, ASC; special effects cinematography, Paul Eagler, ASC; special effects cameraman, Harry Wolf (later ASC); additional cinematography, Lee Garmes, ASC; operative cameraman, Curt Fettner (later ASC); assistant cameraman, Joe Kelly; costumes designed by Lucinda Ballard and Anna Hill Johnstone; sound technician, James G. Stewart; sound effects, Charles Freeman; production effects, Russell Shearman; production manager, Argyle Nelson; assistant director, Arthur Fellows; script supervisor, Charlise Bryant; hair stylist, Larry Germain; makeup, Mel Berns; grip, Morris Rosen; skating supervisor, Skippy Baxter; still man, John Miehle; portrait photographed in Technicolor. Running time, 86 minutes. Released March 29, 1949 by Selznick Releasing Organization.

Jennie Applegate, Jennifer Jones; Eben Adams, Joseph Cotten; Spinney, Ethel Barrymore; Mother Mary of Mercy, Lillian Gish; Matthews, Cecil Kellaway; Gus, David Wayne; Moore, Albert Sharpe; Eke, Henry Hull; Mrs. Jekes, Florence Bates; Pete, Felix Bressart; Captain Cobb, Clem Bevans; Clara Morgan, Maude Simmons.

The writer wishes to thank Linwood G. Dunn, ASC, George E. Turner, John Walker, personnel at the Margaret Herrick Library of the Academy of Motion Picture Arts and Sciences, Buddy Barnett and Eric Caiden for their help with this article.

On the Spot

Office Depot Gets Down to Business

by Mary Hardesty

After advertising agency J. Walter Thompson landed the much-sought-after Office Depot account, commercial cinematographer Bob Gantz and director Rupert Wainwright were assigned to design four sophisticated spots that established the company as an affordable office supply warehouse with high-quality service. Capturing the complexity of modern American businesses for the 30-second spots ("Running a Business," "Not a Hobby," "On Paper," "Forward to School") required the duo to perform at a breakneck pace over the nine-day shoot.

Gantz, an AFI-trained cinematographer with eight years of experience shooting commercials for such clients as Guess Jeans, Revlon and L'Oréal, shot the spots on with a Panavision cameras and utilized Kodak's 5298 for interiors. One device that saved Gantz considerable time during the office meeting scenes was a metal table box topped with Plexiglas and loaded with eight Kino Flos; this averted the need to relight the scene whenever it entailed a close-up, because all those around the table were already lit.

Much of the campaign's centerpiece spot, "Running a Business" (which features offices operating at warp speed), was shot in the former Esprit building in West Hollywood, known for its concrete and steel industrial architecture. Several sets were built around the more visually interesting areas of the vacant building.

"One side of the building held the office set and the other had the conference set; I was able to prelight on one while Rupert was rehearsing on the other," says Gantz.

For the "Forward to School" spot, director Wainwright focused on the technology used by a budding young entrepreneur to prepare a school presentation. A computer expert was on hand to aid Gantz in filming the computer moni-

tors, since two personal computer manufacturers paid extra for their products to be featured prominently.

Notes Ganz, "Fortunately, they didn't require perfect beauty product shots, so we had a lot of latitude. Using a standard film/TV sync box, our tech person synced up the pre-existing footage that was generated from a computer beforehand and then fed into the monitors." To match the monitor speed and exposure, Gantz shot at 30 fps between 2.8 and 4 at 500 ASA. "They [the monitors] seem to read a bit darker than a regular television screen, but the tech was able to accommodate me, warming up the monitors when I used tungsten lighting and cooling them back down for any shots that were lit with HMI's."

By taking his grip (Tom Voelpel) and gaffer (Josh Rich) on a scout of the school site, Gantz determined that it would be difficult to film the classroom interior without blacking out the windows. "We solved the problem by putting really heavy NDs on the lower part of the windows that we see on camera and shining 4Ks that were mounted on towers through the top part of the windows off-camera. By seeing the location ahead of time, we were able to come up with a lighting plan that let us light entirely from the outside with the exception of a little floor fill light."

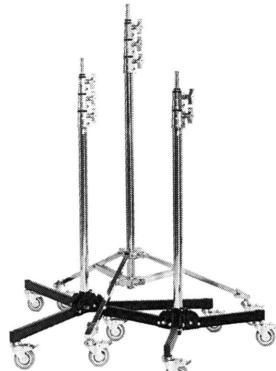
Gantz recommends this type of lighting when working with children. "Shooting this way gives you the freedom to capture those moments you wouldn't get if you lit [the scene] traditionally and blocked out the exact movements. I used a lot of fluorescents for this setup because they work well when placed in the right position. We lit before the kids came on the set, and were able to roll the camera without them knowing. We caught some wonderful, natural moments of them actually playing with the computers." →

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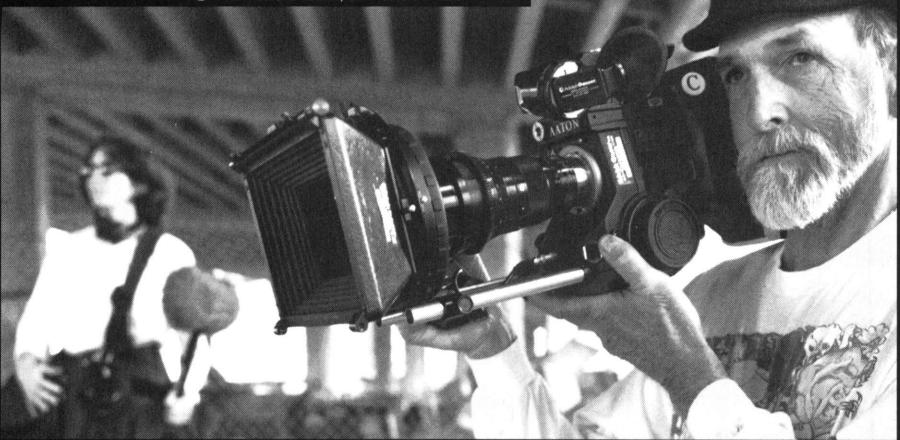


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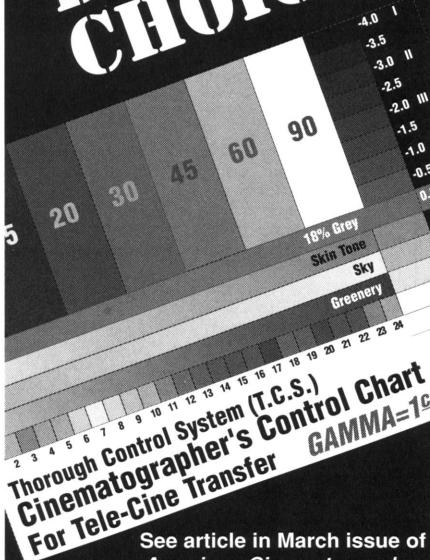
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Complications arose, however, in matching the pair of video projectors used in the female entrepreneur-oriented "Not a Hobby" and the management team-oriented "Running a Business" spots. With hindsight, Gantz says that the next time he finds himself in a similar situation, half a dozen monitors will be hauled to the set instead of just two. Recalls the cinematographer, "They were either too green or too magenta, or they were of different brightness. I never got them perfectly matched. We ended up having to put correction gels on the video projectors to balance them, but by the time we put so many gels on one, it wasn't as bright as the other."

At the distance from which the director wanted to shoot the video projectors, the monitors would not have been bright enough to maintain a very large image, so Gantz had to forsake his favored T2.8 135-420mm Primo zoom for a 300mm T2.0 Panavised Nikon prime. Lens problems surfaced again for an minuscule image needed for "On Paper," the spot which illustrates the central role that paper plays in all business operations.

Explains Ganz, "Rupert wanted to get a close up of the letter 'P' as the typewriter was typing it. Since he didn't want to see a modern-day typewriter ball come up, he chose an old typewriter. Whenever we tried to get an extreme close-up of the 'P,' the old typewriter's striker would hit the macro lens. First we tried the 200mm Primo and Zeiss macros. The Zeiss gives you more magnification and lets you get closer to the object before you hit your minimum focus, but it still wasn't enough. We ended up using a view camera lens because its bellows system allows you to change the plane of focus and get closer." ◆

Client: Office Depot

Four: 30 spots: "Running a Business,"
"Not a Hobby," "On Paper"
and "Forward to School"

Cinematographer: Bob Gantz

Director: Rupert Wainwright

Production company: Sony Pictures
commercials

Agency: J. Walter Thompson/Chicago

compiled by Andrew O. Thompson



New Arri Fixtures

Arriflex introduces the Arrilux 125 Pocket Par, which uses a specially coated glass reflector for its high-efficiency light output and snap-on diffusion lenses to control the beam angle. A set of three lenses for spot, medium and wide-angle beam is available; the unit also offers focus adjustment. The Pocket Par's extruded aluminum housing is only 3" in diameter, less than 7" long and weighs only 2.6 pounds. Powered by either AC or compact 24-30 DC electronic ballast, the unit's performance in a spot is 1170 FC at 10 feet.

Arriflex also announces its Compact 200W and 125W HMI Fresnels. Utilizing the housing of the Arri 300W and 650W Fresnels, the new units share accessories with the aforementioned tungsten fixtures. The 200W unit weighs 6.6 pounds and the 125W unit comes in at 3.75 pounds.

Arriflex, (818) 841-7070, Fax (818) 848-4028.

Dimming Ballasts

Early next year, Kino Flo Lighting Systems will offer a complete line of dimming ballasts for location and studio applications. The systems are high-output (950 milliamper), flicker-free, power-factored dimming electronic ballasts. They can operate medium-base bi-pin lamps remotely, from as far away as 50 feet, and have a full dimming range. These systems operate KF55 (5500°K), KF32 (3200°K) and KF29 (2900°K) full-spectrum lamps; the color rendering of

the latter is rated at 98, which means no color correction is required.

Kino Flo, (818) 767-6528, Fax (818) 767-7517.



Cartop Platform

Carter Cartop Manufacturing offers a new three-person camera platform for all maxivans. Over 36 square feet of deck area provides stable footing for cinematographers and television news camera operators. The platform is easily removable yet secure at any speed on the road; has spar varnished wood-work and epoxy-coated aluminum stanchions for extreme weather conditions; and is lightweight yet strong enough to carry five times its own weight. The platform is also available in one and two-person units and includes a choice of ladders trimmed to match.

Carter Cartop Manufacturing Company, (800) 624-5657.

Miniature Video Camera

JVC Products has developed the KY-F32, a multipurpose camera with a half-inch standard bayonet lens mount. This mount enhances versatility because it makes the camera compatible with a variety of professional lenses. The KY-F32 offers 750 lines of horizontal resolution and a high signal-to-noise ratio of 60dB for broadcast picture quality. Featuring IT half-inch CCDs with micro-lenses, each with 380,000 pixels, the camera achieves a high sensitivity of F9.5 at 2,000 lux and a minimum illumination of six lux.

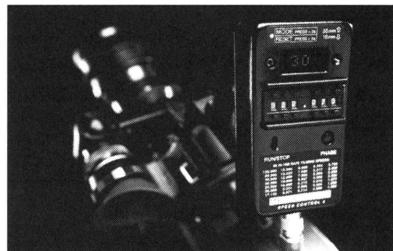
All key function are adjustable

with simple menu-driven operation, or can be set to full automation for unattended operation. Additionally, external remote-control capability for the camera and lens is available through an optional mount remote-control panel, or through a computer's RS-232.

JVC, 1-800-582-5825.

Speed Control

Media Logic offers the Speed Control Four (SC4), which is fully compatible with all Arriflex, Panaflex and Aaton cameras (The SR3, 435 and 535 cameras require a special cable, which will be made available soon). Six pushwheel switches are used to control the camera speed with a range of 1 to 150 fps. All



speeds are crystal-accurate. For convenience, a chart of 60Hz (or 50Hz) flicker-free speeds is provided on the front label. The "phase" button is used for the elimination of the scan bar when filming video monitors.

A high-speed switch eliminates the need to dial in half the desired running speed for the Arri 16SR-HS and Panastar cameras. The unit will also automatically correct the running speed of an Arri 16SP or Aaton LTR internally set to 25 or 30 fps. The main improvement in the SC4 lies in its "smart" alphanumeric display. This bright LED display can function as a tachometer and/or footage counter (the latter can be set to indicate meters and 35mm 3-perf). The display dims over time to conserve power.

Media Logic, (212) 924-3824, Fax (212) 924-3823.

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Production Pack

KATA announces a large multipurpose soft case nicknamed the "Coffin" for its roomy storage capacity. On the outside are four quick-access pockets with hook and loop closures and one that is zipped. The large, see-through zippered pocket under the lid keeps equipment and accessories organized and visible. The Coffin measures 34.8" long, 13" wide and 10" high. A tough Cordura exterior and heavily padded sides stiffened with Polypropylene panels safeguard delicate gear. Movable dividers allow one to customize the interior to accommodate a variety of items. The ergonomically designed APS shoulder strap means comfortable toting of even heavy loads.

KATA, (888) 872-5282, Fax (805) 520-7342.

bility, hot restrike, low energy consumption and comparable lamplife. Using parabolic reflector technology and advanced fixture design, the unit can be powered by any 115 VAC, 15-amp circuit, and can be used both indoors or out. The fixture measures 9 3/4" x 14 3/4" and weighs 17 pounds. It comes complete with cable, barn doors and a set of four diffusion lenses. The system also includes an ultra-light ballast that accepts 115 or 220 volts (15 amps at 120, eight amps at 220).

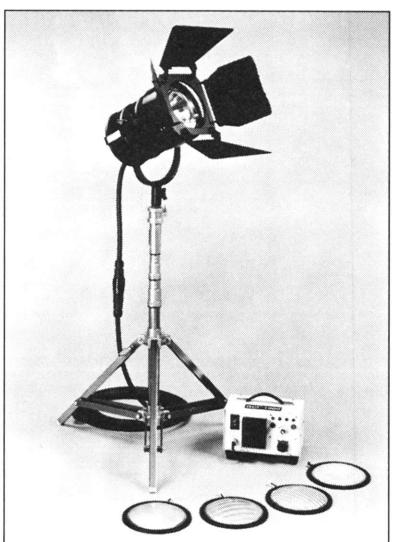
LP Associates, (213) 462-4714, Fax (213) 462-7584.



Rain and Dust Covers

Camera Essentials now makes rain and dust covers for Cinema Products Master Series sleds and monitors, in addition to the model 3A Steadicam. The covers are two-piece units — one fits the sled and the other fits the monitor. The sled is protected by a clear vinyl cover with a neoprene collar around the post. A flap allows quick removal of the battery. The monitor raincover is also vinyl, with an optional non-reflective Plexiglas covering for the screen. Also a part of this line are Steadicam arm protection covers, and a raincover for the Seitz follow focus. The arm protection covers are two-piece gaiters of black nylon oxford, made to fit the CP arms. The arm protection cover is made to move quietly with the arm, and keep it dry and clean.

Camera Essentials, (213) 666-8936, Fax (213) 666-0214.

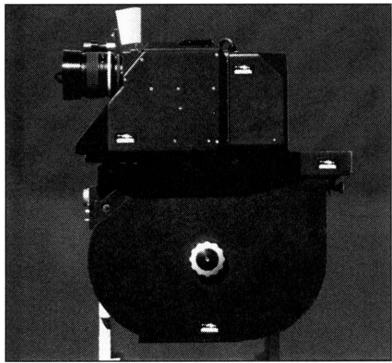


1000W DCI Par

LP Associates introduces the unique 1000W single-ended DCI Par, a direct-current, metal-halide source that silently provides flicker-free daylight temperature (5600 degrees K) output. DCI employs many of the advantages of HMI, including: low heat, dimming capa-

SpaceCam Vista Flyer

SpaceCam systems now offers a VistaVision camera specially built for gyrostabilized work. The Vista Flyer was manufactured by MSM Design of Idaho and features frame rates from 1 to 60fps,



four-pin pulldown, three-pin registration, a Vidiflex fiber optic video tap and a vacuum gate for increased picture sharpness and steadiness. The camera system comes with a full set of high-speed Nikkor lenses, including a 50-300mm zoom lens; it also includes the standard SpaceCam features like 1000' magazines, and full focus and aperture control.

SpaceCam Systems, (818) 889-6060, Fax (818) 889-6062.

Fader Automation System

Uptown Automation announces the System One, a low-cost, self-contained, moving-fader system.

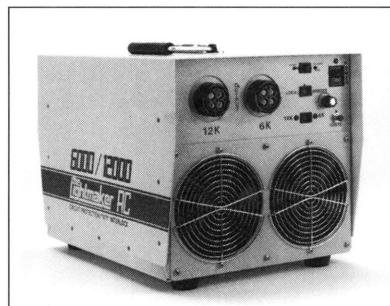
Uptown has taken the full-featured software and system design from its System 2000 and System 900 and adapted it to this unit which patches directly into the insert points of the host console with no need of mechanical or electrical modifications to the console.

The system is small enough to be placed on top of a console's fader section for mixes and then removed for tracking; it is ideal for portable applications or can be taken from studio to studio and patched directly into various mixing consoles. The automation provides a set of mixing functions in a program using a mouse-driven user interface. Full access to grouping, MIDI functions, tape machine control and off-line editing features are also available.

System One is SMPTE/EBU-based and frame accurate. All faders and mutes can be continuously updated with each frame. Since the faders are connected via a sophisticated high-speed communications scheme rather than MIDI, system timing is not degraded when all faders are moving on playback. Fader moves remain locked in sync as a mix grows in complexity. The system is

available in an 8, 16, 24 and 32 channel package, and two boxes may be linked together to automate a total of 64 faders.

Uptown Automation Systems, (616) 695-5948, Fax (616) 695-7623.



Dual Output Ballast

Lightmaker announces its new 6/12K dual output, flicker-free combination ballast for HMI lighting systems. Designed to eliminate the problem of lost or misplaced pigtails, the unit features a positive electro-mechanical selector to ensure correct lighting fixture operation; this results in longer globe life, improved globe compatibility and overall system reliability. The dual output connectors can be supplied to any customer specific-

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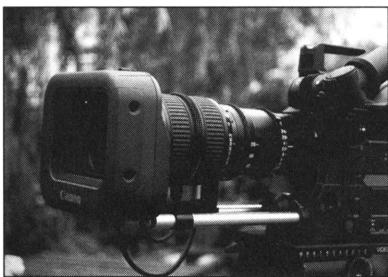
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Lightmaker, (800) 426-6284,
Fax (805) 257-6197.



Stabilization Adapter

OpTex has extended the range of lenses with which Canon's IS-20B Image Stabilization Adapter will function. Originally introduced for Canon's 20X ENG lens, the IS-20B can now be fitted to OpTex's recently launched range of Super 16 and electronic cinematography 20X and 9X zoom lenses, and Canon's 15X ENG lens.

OpTex, 44 (0) 181-441-2199,
Fax 44 (0) 181-449-3646.

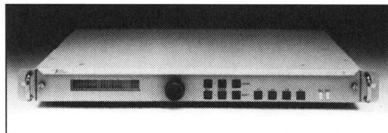
Magnetic Motion Capture

Ascension Technology presents MotionStar Wireless, which captures human motions in real time for animating computer characters. Motion capture lets a performer get under the skin — literally — of a 3-D computer-generated character. Animated results, formerly taking weeks to produce, are instantly available onscreen for direction, camera positioning and interaction. MotionStar Wireless utilizes pulsed DC magnetic fields emitted by its long-range transmitter to track the position and orientation of each sensor over 100 times per second. DC fields are used to minimize metallic distortion problems.

The MotionStar's range extends over a 20-foot perimeter with the transmitter in the center. Up to 14 sensors may be mounted at key points on a performer. Inputs from the sensors travel via cables to a miniaturized, battery-powered electronics unit mounted in a 'fanny pack.' Sensor data and other signals from body-mounted peripherals, such as data gloves, are sent through the air to a base station for final processing. The outputs are transmitted to the user's host computer via a serial or Ethernet

interface. The unit provides the real-time cues for animation software from Alias/Wavefront, Softimage, MEDIALAB, Mr. Film, Digits-n-Art, 3D Studio and others. In addition to use in character animation, MotionStar Wireless has applications in interactive game playing, virtual reality, biomechanical analysis, sports/medical analysis and human performance assessment.

Ascension Technology, (802) 860-6440, Fax (802) 860-6349.



Digital Video Processing

Prime Image's line of digital video equipment now includes the Pick-2, a product that allows buyers to select any two processing capabilities in a single, rack-mounted frame. Any combination of a component time base corrector/synchronizer, direct video synchronizer, audio delay, standards converter, and logo insertion card is available at the purchaser's request. Even different standards — NTSC, PAL and PAL-M — can be specified singly or in combination. Fully self-contained, the Pick-2 allows for easy, front-panel access. The unit is controlled by a front-panel menu or via optional remote control. Other options include three-way adaptive comb filter, high-performance encoder, U-matic dub cable input, RS-232 port and spare power supply.

Prime Image, (408) 867-6519,
Fax (408) 926-7294.

Digital Optical Disc Recorder

Panasonic Broadcast and Television Systems announces the LQ-D5500, a record/erase digital optical disc recorder/player providing broadcast-quality, high-density recordings. The unit utilizes Matsushita's Phase Change (PCE) technology and records up to 41.5 minutes of DVCPRO video and two high-quality 48kHz/16-bit digital audio (PCM) channels. PCE allows direct overwrite to the optical substrate. The LQ-D5500 has an average access time of 0.5 seconds, offering advantages in editing and production speed. A disc can be rewritten more than 10,000 times and played back one million times, assuring high reliability.

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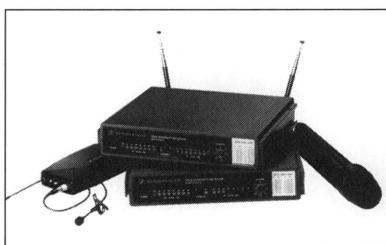
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The LQ-D5500's digital component compression recording delivers 5 MHz in the Y band and 1.5 MHz in the C band, plus a 50 dB video S/N ratio. It offers a broadcast-quality signal of more than 5 MHz of bandwidth, and degradation-free, multi-generation editing and dubbing through digital inputs and outputs. The unit provides a full-frame playback at 40X normal speed in both forward and reverse, and operates with SMPTE time code or frame-number addressing. Users can record in four modes: NTSC composite, Y/C component, RGB and serial digital component. For added versatility, the LQ-D5500 uses the same digital signal as Panasonic's quarter-inch (6.35mm) DVCPRO component format.

Panasonic, (201) 392-4319, Fax (201) 392-6001.



Wireless Receivers

Sennheiser introduces the SET-1081-U and SET 1083-U wireless systems, both of which feature 16 switchable UHF channels available in three frequency groups for up to 24 channels of operation. The units are packaged in a rugged transport case complete with all necessary accessories. At the heart of both systems is the EM1031-U diversity receiver, which has a frequency response of 40-20,000 Hz and weighs 25 oz. Equipped with the Sennheiser hiDyn plus noise reduction system, the DM1031-U features automatic squelch control and state-of-the-art circuitry which incorporates PLL synthesis. Several systems may be used simultaneously by combining two EM1031-Us in a 19" rack installation with supplied rack-mount adapters.

Apart from the receiver, the 1081 system contains a dynamic supercardioid radio microphone. This handheld transmitter (the BF1081-U) offers switchable sensitivity, an output power of 50mW and a frequency response of 80-18,000 Hz. An integrated antenna ensures reliable high-quality transmission. Its ergonomic design and

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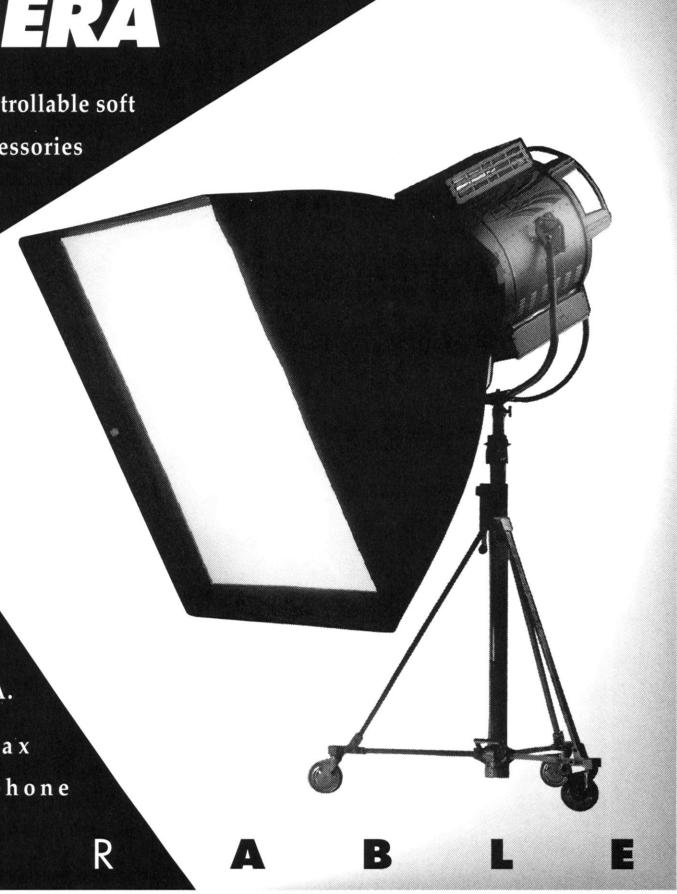
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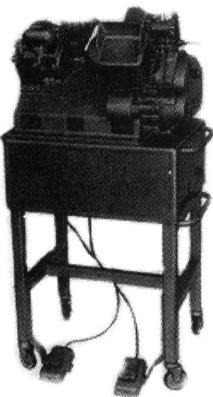
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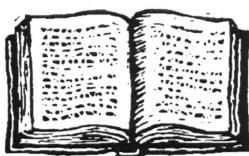
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low weight (9 oz. including battery) are an asset for long shows or presentations.

A single 9V battery permits eight hours of continuous operation, and an LED display indicates when the battery needs replacement. The 1083 system contains a pocket transmitter (the SK1063-U) that can be unobtrusively hidden in clothing or attached to the belt; this connects to the system's miniature clip-on lavalier microphone (the MKE2-1053). With switchable microphone sensitivity, the transmitter has an operating time of eight hours. Frequency response is 80-20,000 Hz (=1/-3 dB) and output power is 50mW.

Sennheiser, (860) 434-9190,
Fax (860) 434-1759.

ShadeTree Software

Cinema Graphic unveils

ShadeTree software designed for use with Pixar's RenderMan rendering software on the Silicon Graphics platform. ShadeTree is an interactive shader language authoring tool that allows non-programmers to quickly create and edit shaders for RenderMan. These shaders can set the mood of a scene, with a colorful portrayal of surfaces, lights and atmospheres. Users begin working with materials, colors, textures and images, and then mix them with pre-built macro "boxes" to form a shader.

Connecting the macro boxes in a treelike graph gives one the full power and flexibility necessary to create any shader. To obtain demanding shaders written in less time, there are more than 100 pre-built example shaders to get the user up and running quickly; there are also more than 50 regular and random pattern generators to help add fine details to surfaces without having to build complex models. ShadeTree has an open architecture, allowing users to add their own custom macro boxes at any time.

CinemaGraphics Inc., (818) 718-6320.

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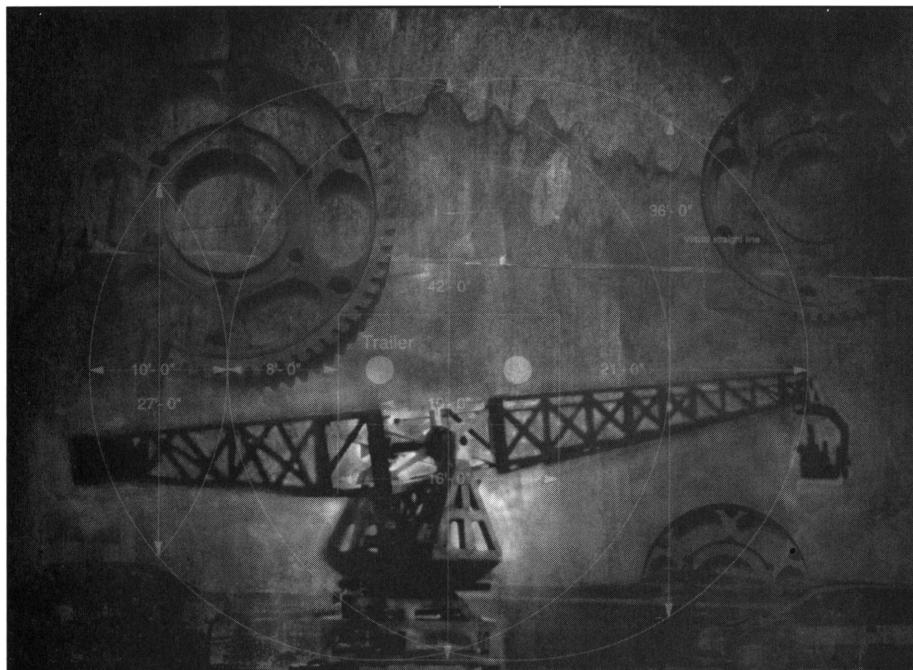


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The VPL-V500Q multimedia projector achieves 500 ANSI lumens of light output due to a combination of a newly developed optical unit, a 250W short arc DC Metal Halide Lamp (with a 3,000 hour life span) and large aperture lens. This short arc design also produces a collection of light; a large diameter reflector ensures bright image reproduction. The projector also features Fly-Eye light integrators, which attain a uniformed image on-screen, virtually eliminating "hot spots."

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Sony, (800) 472-7669. ♦

Points East

"Digital Manipulation" Takes on Strange Meaning in *Seven Servants*

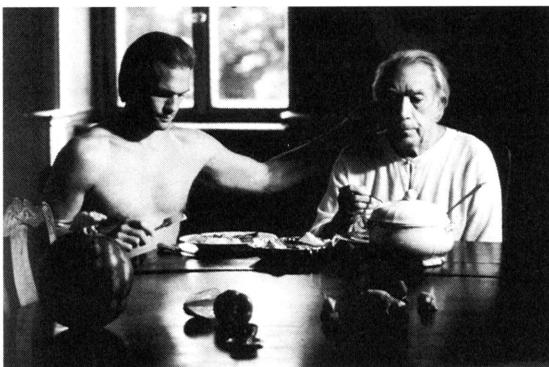
by Brooke Comer

Seven Servants presents a truly eccentric premise: the wealthy, aged Archie (Anthony Quinn) attempts to fend off his imminent death by hiring four young men to move into his castle and keep their fingers plugged into his nostrils and ears in order to help him retain his life essence. In adjusting to this attachment, the five men move with the fluid grace of a dancing octopus, until they become one organism with collective powers; Archie can even breathe underwater through his surrogate lungs. Together, the group prepares elegant meals and fends off burglars.

Seven Servants' Iranian born director, Daryush Shokof, is a former painter whose experimental art videos were, he admits, "too conceptual or philosophical to win mainstream acclaim." This video work, however, gave him tremendous freedom to experiment with the camera, framing and lighting techniques that he applied to his first celluloid project. Championing Shokof in this high-concept film is his mentor of 20 years, international film scholar/critic Bahman Maghsoudlou. A fellow Iranian expatriate, Maghsoudlou produced Shokof's art videos, as well as *Seven Servants*.

Cinematographer/co-executive producer Stefan Jonas, a partner in the film's Frankfurt-based production team Das Werk, became excited at the prospect of collaborating with an artist/director. Comments Jonas, "*Seven Servants* is a poetic comedy, along the lines of [the works] of Buñuel, Greenaway and Tarkovsky. Because he's a painter, Daryush contributed visions and philo-

sophical ideas that gave the film a surrealistic craziness." To bring that surrealism to the screen, Jonas says he utilized "an observing camera style with long smooth tracking and crane movements. Nearly every shot was done on a Panther or Tulip Crane, which you don't



see, but you certainly can feel."

During Jonas and Shokof's preproduction discussions of camera details and the film's overall style, the director showed the cinematographer an array of Flemish paintings, "which had the same colors, and reflected the same kind of atmosphere that we were trying to create," says Jonas. The director of photography selected Arriflex cameras for *Seven Servants*: the 535 for first and second unit; the 435 for various speed effects; a BL-IV for Steadicam use; and the 35-III for studio shots of fruits, which create diverting sequences within the film. Says Shokof, "It was better that we didn't have camerawork with a lot of tricks because the concept of the film was enough. Playing around with the camera — zooming forward and tracking back — would have taken away the film's weird punch."

Both Jonas and Shokof wanted to shoot on high-contrast film, but there were constant color consider-

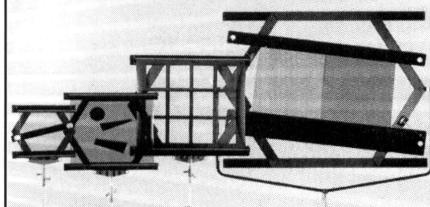


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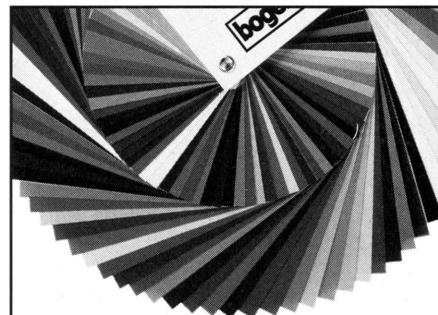
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ations which complicated the choice of stocks. Notes the director, "One of the actors was black, and Anthony Quinn wears pale colors in every scene, which would have washed out. I wanted to keep the whole film in a rich, warm tone." Jonas opted for Kodak's 5297 daylight stock, which he supplemented with sepia 1 and 2 filters. Recalls the cinematographer, "It worked very well with the faces. We still had a fine grain by over-exposing it about two-thirds of a stop." Jonas even employed sepia for party scenes shot with incandescent lights. "While the faces were not affected," he says, "everything else came out in the warm tone we sought."

Jonas also wanted the lighting inside Archie's estate (a Nuremberg castle) to appear as natural as possible; he put 12K fixtures outside interior windows to compliment the warm sunlight flowing into the rooms. "This wasn't easy," the cinematographer explains, "because the castle was surrounded by a huge water-filled moat, and we couldn't get that close, even with cranes. Fortunately, the 12Ks were bright enough, even if they weren't as close as we'd have liked."

Posing further production problems were the physical limitations of fitting all five attached actors into the frame at once, and still acquiring the desired background. Jonas admits, "It was hard to show all five characters not as five separate people but as one large creature." According to the director, a choreographer was brought in "not to show them how to move, but to show them how not to move. We didn't want them moving in unison. We wanted a sense of separateness, a unique identity from each one that would be defined in his movements."

Quinn, who has appeared in more than 350 films, did not mind having so many fingers in his orifices for most of *Seven Servants*. Jonas recalls questioning the veteran actor about his comfort during a scene in which he's plugged up by his servants. "We asked him if he would prefer to have their fingers extended with latex to make it more comfortable, even though this would have been visible in extreme close-ups. He shrugged and said, 'Just put in the fingers.'"

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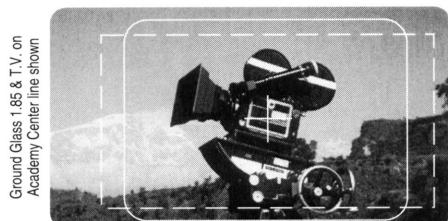
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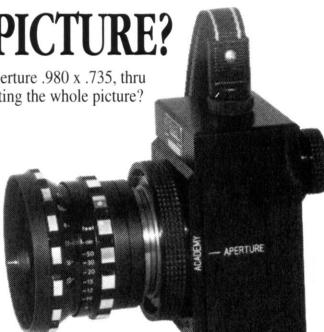


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Books in Review

by George Turner

On the Road to Tara

by Aljean Harmetz
Harry N. Abrams, Inc.,
224 pps. cloth

During the past 57 years, several well-written books have recounted *Gone with the Wind's* rocky road to the silver screen. Most lovers of this landmark movie probably have some or all of them, but *On the Road to Tara* stands on its own merits. For anyone interested in the artistic aspects of David O. Selznick's magnum opus — or the role of art in the making of any great film — this is a tome to treasure.

The text, by seasoned *New York Times* writer Aljean Harmetz, is fact-filled and tightly written. Much of the expected material is here, including yet another variation on why George Cukor was fired, along with a sampling of unpleasant behavior by Clark Gable and principal director Victor Fleming. There is a lot of fresh material as well, much of it gleaned from the vast Selznick Archive at the Harry Ransom Humanities Research Center of the University of Texas at Austin. While hundreds of actresses were fighting to land the role of Scarlett O'Hara, it's interesting to learn that both Gable and Leslie Howard represented having to do the picture and were uncomfortable in their roles. There are many behind-the-scenes photos, mostly by Fred Parrish, which have never been reproduced before. They give us a good look at (among many others) directors Fleming, Cukor and Sam Wood; production designer William Cameron Menzies; art director Lyle Wheeler; cinematographer/matte artist Jack Cosgrove, ASC; costume designer Walter Plunkett; editor Hal Kern; directors of photography Ray Rennahan, ASC and Ernest Haller, ASC; camera operator Arthur Arling; and assistant cameraman (and future ASC President) Harry Wolf. Also interesting are wardrobe and hairstyle tests quite unlike those seen in the movie. Much production paperwork is shown or cited.

What really sets *On the Road*

to *Tara* apart, though, is its magnificent collection of more than 100 rare production illustrations. Most of these are superbly reproduced in color on good, heavy stock often in full-page (10" x 11") or double-page formats. The watercolor renderings are by Menzies, J. McMillan Johnson, Dorothea Holt, Jack Martin Smith, Frank Powers, Plunkett and others who remain anonymous. Architectural elevations and construction drawings from Wheeler's department are included.

About 200 of the estimated 1,200 to 1,500 *GWTW* production illustrations are preserved in the archive in Texas; a few more exist in other collections. I remember Harry Wolf wincing as he once told your humble reviewer that when the Selznick studio closed its doors, he personally witnessed hundreds of paintings and drawings from *GWTW*, *Rebecca*, *The Adventures of Tom Sawyer* and other classics being shoveled into the studio furnace. *On the Road to Tara* gives a good sampling of what is left.

Lost Films

by Frank Thompson
Citadel Press, 320 pps.,
paperback, \$16.95

Motion pictures have been in existence for more than a century, offering entertainment and education while (quite incidentally) providing a chronicle of their times. Of about 21,000 features and short films produced before 1950, more than half are lost films due to the decomposition of nitrocellulose film stock, fires, and careless discarding. In this remarkable example of film scholarship, Thompson describes in detail 27 important films made in the United States between 1911 and 1929 that are among the missing.

Needless to say, Thompson was unable to study the films themselves. He therefore did the next best thing, obtaining information from studio files, contemporary reviews, and interviews. The author provides precise cast, credits and story descriptions for each

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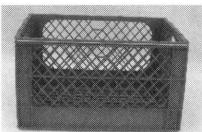


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photos by Eric Eggly, Point Seven Studios

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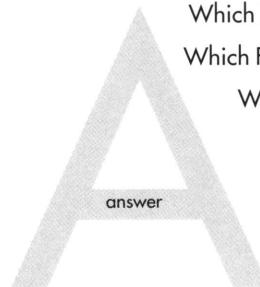
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picture. The earliest is *The Immortal Alamo*, produced by Gaston Méliès and featuring Francis Ford, Edith Story, and (as the Mexican Army) cadets of the Peacock Military Academy. The last is F.W. Murnau's *Four Devils*, starring Janet Gaynor and Charles Morton (released as a silent in 1928, and with a Movietone track of music, sound effects and talking sequences in 1929). In between are 25 tantalizing titles, including *Cleopatra* (1917) with Theda Bara; John Ford's *Roped* (1919) with Harry Carey as Cheyenne Harry; *That Royle Girl* (1926), directed by D.W. Griffith and starring W.C. Fields; Paul Fejos' experimental *The Last Moment* (1927); William Wellman's *Legion of the Condemned* (1928) with Gary Cooper and Fay Wray; and Ernst Lubitsch's *The Patriot* (1928) with Emil Jannings.

The stories are accompanied by rare stills, adding up to a rich bundle of little-known information.

Directing: Learn from the Masters

by Tay Garnett
Edited by Anthony Slide;
introduction by
Francois Truffaut
Scarecrow Press, 333 pps.,
library binding

Tay Garnett, veteran director of *China Seas* and *The Postman Always Rings Twice*, was compiling this material at the time of his death in 1977. Garnett had resolved to publish a book in which the great film directors answered a questionnaire on such topics as how they entered the industry, their working relations with cast and crew, and their use of sound and music. Ironically, *Directing* was initially published only in France. Now it has finally made its debut in English, and a nifty job it is.

Among the 43 filmmakers who responded were Clarence Brown, Allan Dwan, Henry King, Mervyn LeRoy, Lewis Milestone Robert Wise, Jean Renoir, Rene Clair, Federico Fellini, Satyajit Ray, Don Siegel, Martin Scorsese, Steven Spielberg and Fred Zinnemann. The questions are intelligent, the replies revealing. Garnett has bequeathed a practical gift to film students, scholars and historians. It's unfortunate that there are no photos, even on the jacket. Aren't pictures what movies are all about? ♦

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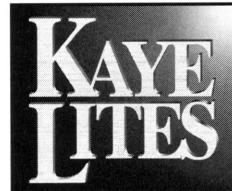
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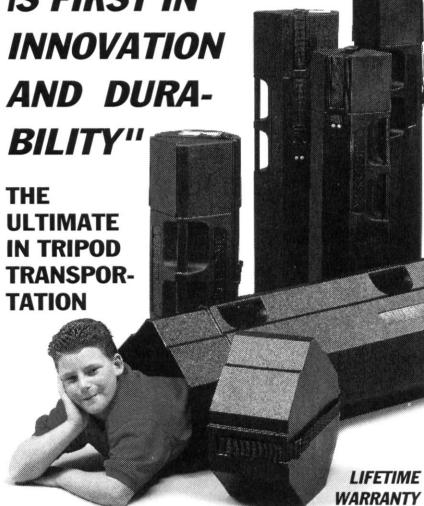
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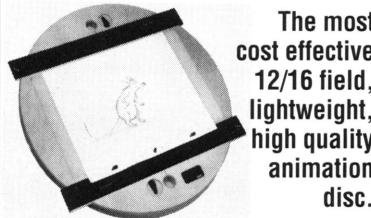
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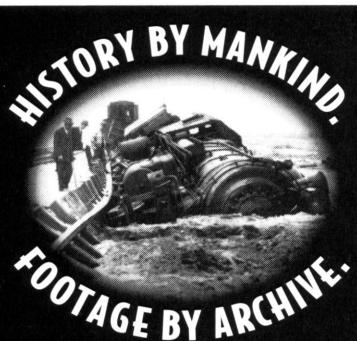
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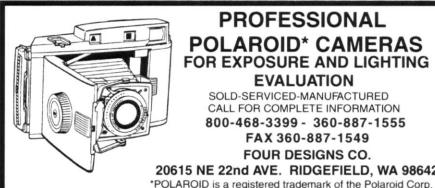
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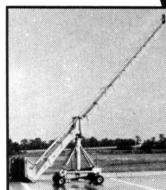
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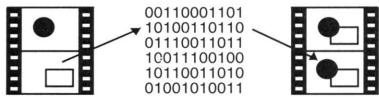
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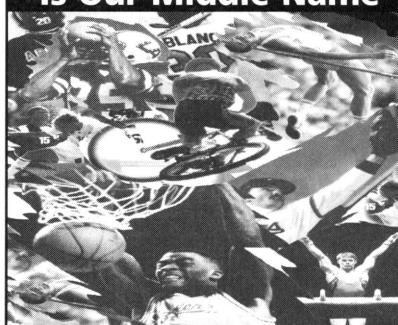
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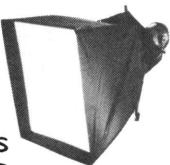
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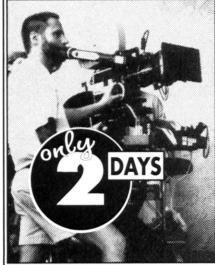
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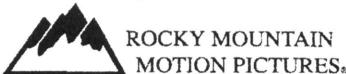
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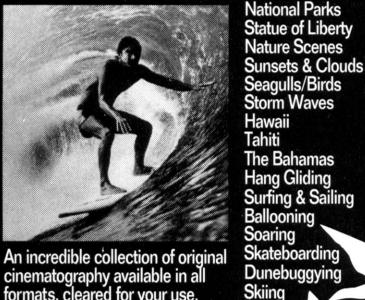
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Advertiser's Index

- AC 118, 133, 134
A & J Cases 89, 98, 125
Action Sport 128A
Adolph Gasser 112
Alan Gordon 125, 127
Animation
 Celebration 79
Archive Film 127
Arriflex 28-29
Avid Technologies 49
Backstage Equipment
 124
Barbizon 53
Benjamin
 Centoducati 126
Birns & Sawyer 25, 121
Bob Ulland C-4
Bogen Photo 17,
 111, 121
Boston Camera 78
Boston Film Factory 101
Camera Control 26
Camera Essentials 117,
 131
Camware 128A
Celco 95
Century Precision 22,
 103, 128B
Chambliss 128A
Chapman Studio 128
Chesapeake Camera
 128A
- Chimera 117
Cine Sound5 128A
Cine South 128B
CineAsst 128B
Cinekinetic 2, 123
Cinema Engineering
 128B
Cinema Products 116,
 C-2
Cinematography
Electronics 81, 83
Cineon 45
Cinequipt 90
Cineric 128A
Cinovation 128A
Clairmont 8-9, 73, 118
Clamp Flag 128B
Columbia College 122
Computer Film
 Company 71
Denecke 10
Discreet Logic 15
Dittrich Films 126
DN Labs 128B
Du All Camera 12
Dream Quest 55
Eagle Systems 128A
Eastman Kodak 7, 57, 67
Energy Film Library 128B
Eurocrew 128
- Fabulous Footage 127
Film Video 117
First Light 104
Fish Films 128A
Fletcher Chicago 89
Focus Optics 128A
Four Designs 127
Fries Engineering 122
Fuji Motion Picture 33
Gamma & Density 112
Geo Film 120
Glidcam Industries 80
Great American
 Market 78, 102
Greg Hensley 125
H K Technica 128B
Hollywood Film Inst.
 128B
Hybrid Cases 128A
Hydroflex 127
Image G 120
Image Maker 127
Imagica 89
International Cinema
 118
Isaia & Company 114,
 123
J.L. Fisher 87
Janice Arthur 14
Nalpak 126
NCE of Florida 126,
 128B
- K&H Products 90
K 5600, Inc. 119
Kaye Lites 125
Kenworthy 103
Kino Flo 119
Kish Optics 128B
Laser-Pacific 5
Leather Cam 131
Leonetti 62
Light Wave Systems 6
Lightning Strikes 98
London Intl. 124
Long Valley 129
Lowel Light 101
LTM Corp. 38
Lynx Robotic 119
MacGillivray 129
Mathews 24, 96, 98
Mazilview 127
Media Logic 120
Military 128A
Miller Canada 127
Miller Fluid Heads 4
MKA 36
Movie Tech 81
Moving Cam 87
MPS 80
Musco Mobile 74
Rosco 35
SBD Tech 101
Schneider Lenses, 88, 90
SL Cine 131
SMS 128B
Spacecam 19
Sprint 13
ST Productions 128A
- New York Film
Academy 88
Norris Film 105
O'Connor Engineering 94
Oppenheimer 37, 98
Panavision Corporate
 65
Panavision Fla. 115
Panavision Hollywood 1
Panther GMBH 39
Peter Lisand 128A
Preston Cinema
 Systems 63
Prosource 129
Quantel 23
Queensland School 112
Rafael Estrella 128B
Rainmaker Digital 80
RGB Color Lab 129
Rocky Mountain 128B
Rosco 35
SBD Tech 101
Schneider Lenses, 88, 90
SL Cine 131
SMS 128B
Spacecam 19
Sprint 13
ST Productions 128A
- Vancouver Film 64
Versa Flex 128
Victor Duncan 11
VI/FX/Video Image 66
Viking Generators 105
Vision Crew 122
Visual Products, Inc.
 12, 125
Walt Disney 37
Weaver Steadman 27
Westcott 124
Whitehouse 128, 129
Wide Screen 129
Wildfire C-3
William F. White 131
Willy's Widgets 129
ZGC, Inc. 103, 105

American Cinematographer 1996 Index

Index by Film Title, Subject and Cinematographer compiled by Christopher Probst

- 101 Dalmatians**, Nov. p. 75, production design
301-302, Nov. p. 82, Eun-Gil Lee
- A Little Princess**, Jun. p. 80, Emmanuel Lubezki, AMC
- A Time to Kill**, Aug. p. 72, Peter Menzes, Jr.
- Alberti, Maryse, *When We Were Kings*, Apr. p. 80
- Alekan, Henri, career profile, Mar. p. 46
- Aliens: Ride at the Speed of Fright**, Aug. p. 20, Paul Gentry
- Alton, John, career profile, Sept. p. 87
- Ambrico, William, *Seeking the Cafe Bob*, Mar. p. 56
- American Buffalo**, Feb. p. 52, Richard Crudo
- Andersonville**, Oct. p. 72, Ric Waite, ASC
- Arbogast, Thierry, AFC, *Ridicule*, Dec. p. 104
- Aronovich, Ricardo, *Celestial Cockwork*, Jul. p. 101
- Ascher, Steven, *Troublesome Creek: A Midwestern*, Apr. p. 76
- Atherton, Howard, BSC, *Gulliver's Travels* (Part 1), Oct. p. 71
- Awards
- "1996 Emmy Nominations," Oct. p. 66
 - "1996 Sci-Tech Awards," May p. 87
 - "ASC Salutes Sven Nykvist," Feb. p. 46
 - "Big Moments on the Small Screen," May p. 70
 - "Cinematic Transcendence," Jun. p. 74
 - "Henri Alekan: The Doyen of French Cinematography," Mar. p. 46
 - "IDC/2 Takes Stock of Documentaries," Jan. p. 18
 - August, Joseph, ASC, *Portrait of Jennie*, Dec. p. 106
 - Babylon 5 "Comes the Inquisitor,"** Oct. p. 66, John C. Flinn III, ASC
 - Bailey, John, ASC, Filmmakers' Forums, Jan. p. 12, Sept. p. 119
 - Ballhaus, Michael, ASC, *Sleepers*, Oct. p. 34
 - Bartley, John S., CSC, *The X-Files* "731," May. p. 72, Oct. p. 68
 - Batman Forever**, Apr. p. 127, Stephen Goldblatt, ASC
 - Beebe, Dion, ACS, *Floating Life*, Dec. p. 101
 - Beyond the Frame
 - "Hitting the Shots on *Eddie*," Jun. p. 32
 - "One Drink Minimum," Feb. p. 28
 - "Strangers in the Snow," Jan. p. 30 - Biroc, Joseph, ASC, *In Memoriam*, Nov. p. 112
 - Bitter Sugar**, Nov. p. 101, Claudio Ched
 - Blanford, Larry, commercial "Ice Cream Truck," Oct. p. 93
 - Blick, John, *The Frighteners*, Aug. p. 52
 - Bloody Child, The**, Oct. p. 16, Nina Menkes
 - Bollinger, Alun, *The Frighteners*, Aug. p. 52
 - Bota, Rick, *Tales From the Crypt* "You Murderer," May p. 72
 - Braveheart**, Jun. p. 74, John Toll, ASC
 - Breaking the Waves**, Dec. p. 18, Robby Müller, BVK, NSC
 - Brinkmann, Robert, *The Cable Guy*, Jul. p. 77
 - Broken Arrow**, Apr. p. 54, special effects
 - Burks, Robert, ASC, *Vertigo*, Nov. p. 86
 - Burum, Stephen, ASC, *Mission: Impossible*, Jun. p. 42
 - Butler, Bill, ASC, *Flipper*, May. p. 46
 - Cable Guy, The**, Jul. p. 77, Robert Brinkmann
 - Carpenter, Russell, ASC, *Terminator 2 3-D*, Jul. p. 38
 - Celestial Clockwork**, Jul. p. 101, Ricardo Aronovich
 - Chocolate Hope "Leave of Absence,"** May p. 76, Kenneth D. Zunder, ASC
 - China Seas**, May p. 92, Ray June, ASC
 - Clark, Curtis, ASC, Filmmakers' Forum, Mar. p. 112, commercial "Infinity NYC," Apr. p. 103
 - Clothier, William J., ASC, *In Memoriam*, Mar. p. 108
 - Color of a Brisk and Leaping Day**, Apr. p. 78, Rob Sweeney
 - Condon, Ron, commercial "Amazing Grace," May. p. 97
 - Coulter, Michael, BSC, *Sense and Sensibility*, Jun. p. 80
 - Craft, The**, May p. 30, Alexander Gruszkynski
 - Crimson Tide**, Jun. p. 84, Dariusz Wolski, ASC
 - Crudo, Richard, *American Buffalo*, Feb. p. 52
 - Cutrone, Tony, *Movie Maker CD-ROM*, Apr. p. 69
 - Cyclo**, Sep. p. 62, Benoit Delhomme, AFC
 - Czapsky, Stefan, *Matilda*, Aug. p. 62
 - Danielle Steel's Zoya**, May p. 83, Laszlo George, CSC
 - Davis, Elliot, *Get on the Bus*, Nov. p. 56
 - Deakins, Roger, ASC/BSC, *Fargo*, Mar. p. 28
 - DeLespinois, Pierre, commercial "Follow the Leader," Jun. p. 129
 - Delhomme, Benoit, AFC, *Cyclo*, Sep. p. 62
 - DeMarco, Frank, *Theremin: An Electronic Odyssey*, Jan. p. 58
 - Di Palma, Carlo, AIC, *Mighty Aphrodite*, Feb. p. 60
 - Diabolique**, Apr. p. 36, Peter James, ASC, ACS
 - Dinosaurs of the Gobi Desert**, Oct. p. 103, Michael Mayers
 - Digital Technology
 - "Archivists Warn: Don't Depend on DAT," Aug. p. 14
 - "Breakthrough in Flat-Panel Displays," Apr. p. 115
 - "Electronic Cinematography: Round Three," Jan. p. 14
 - "Personal Video Comes of Age," Mar. p. 12
 - "The Virtual Studio," Dec. p. 14
 - "The Wired Living Room," Sep. p. 12
 - "Video's Image-Quality Debate," Jun. p. 10 - Divas**, May p. 79, Ron Garcia, ASC
 - Documentaries
 - "A Testament to Tragedy," Jan. p. 70
 - "Hospice Offers Hope," Jan. p. 75
 - "Kartemquin: A Different Kind of Dream Factory," Apr. p. 98
 - "Music from Another World," Jan. p. 58
 - "Racing Along *The Water's Edge*," Feb. p. 65
 - "Sundance '96: Of Cel Phones and Celluloid," Apr. p. 80
 - "Unifying A Visual Truth," Jan. p. 63 - Dorothy Day**, Mar. p. 73, Michael Fash, BSC
 - Dragonheart**, Jun. p. 96, David Egby, ASC
 - Draper, Rob, ACS, *The Spitfire Grill*, Sep. p. 108
 - Drummond, Randy, *Welcome to the Dollhouse*, Apr. p. 74
 - Dryburgh, Stuart, *Lone Star*, Jun. p. 139
 - Ecstasy**, Nov. p. 84, Flavio Martinez
 - Eddie**, Jun. p. 32, Victor Kemper, ASC
 - Egby, David, *Dragonheart*, Jun. p. 96
 - Elliot, Paul, *Truman*, May. p. 78
 - ER "Hell and High Water,"** Oct. p. 67, Richard Thorpe
 - Eraser**, Jul. p. 69, Adam Greenberg, ASC
 - Escape From L.A.**, Sep. p. 76, Gary Kibbe, Sep. p. 81, special effects
 - Falling for You**, May p. 79, David Franco
 - Fan, The**, Sep. p. 54, Dariusz Wolski, ASC
 - Fante, John V., commercial "Big Game" part 1, Feb. p. 91, part 2, Mar. p. 91
 - Fargo**, Mar. p. 28, Roger Deakins, ASC, BSC
 - Fash, Michael, BSC, *Dorothy Day*, Mar. p. 73
 - Female Perversions**, Apr. p. 94, Teresa Medina
 - Flinn III, John C., ASC, *Babylon 5 "Comes the Inquisitor,"* Oct. p. 66
 - Film Festivals
 - "A Cinematic Melting Pot," Dec. p. 99
 - "Finding an Audience at the Fort Lauderdale Film Festival," Jan. p. 91
 - "Honoring Unique Visions," Nov. p. 80
 - "Sundance '96: Of Cel Phones and Celluloid," Apr. p. 80
 - "The Road to Cairo's 19th Annual Film Festival," Feb. p. 99
 - "Unusual Offerings Highlight Toronto Film Festival," Feb. p. 16 - Filmmakers' Forum
 - "ASC Members Riposte *Variety* Article," Aug. p. 112
 - "Can We Save the Shot?," Jan. p. 12
 - "Filtering Out the Nonsense," May p. 120 - "Net Gains in Cyberspace," Mar. p. 112
 - "Scouting the Past," Sep. p. 119
 - Flipper**, May p. 46, Bill Butler, ASC
 - Floating Life**, Dec. 101, Dion Beebe, ACS
 - Fort Apache**, Jun. p. 106, Archie J. Stout, ASC
 - Fraker, William, ASC, *The Island of Dr. Moreau*, Sep. p. 44
 - Franco, David, *Falling for You*, May. p. 79
 - Frighteners, The**, Aug. p. 52, Alun Bollinger, John Blick, Aug. p. 55, special effects
 - Gagnier, Hugh K., ASC, *In Memoriam*, Mar. p. 109
 - Gantz, Bob, commercial "Running a Business," Dec. p. 103
 - Garcia, Ron, ASC, *Divas*, May. p. 79
 - Gaslight**, Jan. p. 79, Joseph Ruttenberg, ASC
 - Gentry, Paul, *Aliens: Ride at the Speed of Fright*, Aug. p. 20
 - George, Laszlo, CSC, *Danielle Steel's Zoya*, May. p. 83
 - Get on the Bus**, Nov. p. 56, Elliot Davis
 - Ghost and the Darkness, The**, Nov. p. 34, Vilmos Zsigmond, ASC
 - Giant**, Oct. p. 86, William C. Mellor, ASC
 - Gillham, Dan, *Notes from Underground*, Apr. p. 88
 - Goldblatt, Stephen, ASC, *Batman Forever*, Apr. p. 127
 - Goldsmith, Paul, *When We Were Kings*, Apr. p. 80
 - Green, Jack, ASC, *Twister*, May. p. 36
 - Greenberg, Adam, ASC, *Eraser*, Jul. p. 69
 - Gruszynski, Alexander, *Kingfish: A Story of Huey P. Long*, May. p. 80, *The Craft*, May. p. 30
 - Gulliver's Travels** (Part 1), Oct. p. 71, Howard Atherton, BSC
 - Harrison, Cry of the City**, Oct. p. 68, Robert Primes, ASC
 - Heat**, Jan. p. 46, Dante Spinotti, AIC
 - Heavenly Peace**, Jan. p. 63, Richard Gordon
 - Historicals
 - "*China Seas*: An All-Star Trip," May p. 92
 - "Dust and Danger at *Fort Apache*," Jun. p. 106
 - "*Gaslight* Twice Told (Part 2 of 2)," Jan. p. 79
 - "*Giant* Still Towers," Oct. p. 86
 - "Hitchcock's Acrophobic Vision," Nov. p. 86
 - "Joseph August, ASC's Swan Song: *Portrait of Jennie*," Dec. p. 106
 - "Rediscovering *The Lost Squadron*," Feb. p. 85
 - "*The Sea Hawk* Sets Sail (Part 1 of 2)," Jul. p. 86, (Part 2 of 2), Aug. p. 88
 - Hospice**, Jan. p. 75, Albert Maysles
 - I Shot Andy Warhol**, Apr. p. 82, Ellen Kuras
 - In Memoriam
 - Biroc, Joseph, ASC, Nov. p. 112
 - Clothier, William J., ASC, Mar. p. 108
 - Gagnier, Hugh K., ASC, Mar. p. 109
 - Kelley, Richard A., ASC, Jan. p. 102
 - Niver, Kemp, ASC, Dec. p. 134 - Independence Day**, Jul. p. 32, Karl Walter Lindenlaub, BVK, Jul. p. 43, special effects
 - Independents
 - "An Economy of Sarcasm," Mar. p. 54
 - "Character-Based Camerawork in *The Spitfire Grill*," Sep. p. 108
 - "Clocklike Precision," Jul. p. 101
 - "Days of Wine and Hypnosis," Mar. p. 68
 - "Digital Manipulation" Takes on Strange Meaning in *Seven Servants*, Dec. p. 113
 - "Giving Back to *Dorothy Day*," Mar. p. 73
 - "Hope and Despair in Cuba," Nov. p. 101
 - "One From the Heart of Texas," Mar. p. 56
 - "Rude Awakening," Mar. p. 60
 - "Sayles Conccts Authentic Tex-Mex Murder Mystery," Jun. p. 139
 - "Sharpen the Saw: Ingenuity and Experience Fuel First Feature," Jul. p. 26
 - "Swingers' Director-Cinematographer Says 'Make Mine a Double!'," Nov. p. 116
 - "The Birth of Nina Menkes' *The Bloody Child*," Oct. p. 116

"Tom Krueger Shoots *Manny & Lo*," Aug. p.101
 "Vicious Cycle," Sep. p.62
 "Von Trier and Muller: Ascetic Aesthetic on *Breaking the Waves*," Dec. p. 18
Invaders, The, May p. 84, Alar Kivilo
Island of Dr. Moreau, The, Sep. p. 44, William Fraker, ASC
James and the Giant Peach, May p. 54, Hiro Narita, ASC, *James and the Giant Peach*, May. p. 54
James, Peter, ASC/ACS, Diabolique, Apr. p. 36
 Johnson, Hugh, *White Squall*, Feb. p. 36
 Jonas, Stefan, *Seven Servants*, Dec. p. 113
Jumanji, Feb. p. 73, Tom Ackerman, special effects
 June, Ray, ASC, *China Seas*, May. p. 92
 Jur, Jeff, *Unforgettable*, Jan. p. 52
Kabloonak, Jan. p. 30, Francois Protat, Jacques Loiseleur
Kansas City, Sep. p. 34, Oliver Stapleton
 Keating, Kevin, *When We Were Kings*, Apr. p. 80
Kelley, Richard A., ASC, In Memoriam, Jan. p. 102
 Kemper, Victor, ASC, *Eddie*, Jun. p. 32
 Kennan, Wayne, ASC, *Seinfeld*, Oct. p. 56
 Khondji, Darius, AFC, *Stealing Beauty*, Jun. p. 54
 Kibbe, Gary, *Escape from L.A.*, Sep. p. 76
Killing Jar, The, Mar. p. 68, Michael Wojciechowski
King and I, The, Jun. p. 16, restoration
Kingfish: A Story of Huey P. Long, May p. 80, Alexander Gruszkis
 Kivilo, Alar, *The Invaders*, May. p. 84
 Koltai, Lajos, ASC, Hungarian Seminar, Feb. p. 81
 Kovacs, Laszlo, ASC, *Multiplicity*, Jul. p. 52
 Kozachik, Pete, *James and the Giant Peach*, May. p. 54
 Krueger, Tom, *Manny & Lo*, Aug. p. 101
 Kuras, Ellen, *I Shot Andy Warhol*, Apr. p. 82
Leaving Las Vegas, Feb. p. 28, Declan Quinn
 Lee, Eun-Gil, 301-302, Nov. p. 82
 Leonetti, Matthew F., ASC, *Star Trek: First Contact*, Dec. p. 58
 Liman, Doug, *Swingers*, Nov. p. 16
 Lindenlaub, Karl Walter, BVK, *Up Close and Personal*, Apr. p. 46, *Independence Day*, Jul. p. 32
 Loiseleur, Jacques, *Kabloonak*, Jan. p. 30
Lone Star, Jun. p. 139, Stuart Dryburgh
Lost Squadron, The, Feb. p. 85, Leo Tover, ASC
 Lubezki, Emmanuel, AMC, *A Little Princess*, Jun. p. 80
 Lukac, Tom, commercial "Science Project," Jul. p. 91
Man Who Captured Eichmann, The, Dec. p. 30, Robert Steadman, ASC
Manny & Lo, Aug. p. 101, Tom Krueger
Mars Attacks!, Dec. p. 40, Peter Suschitzky, BSC, Dec. p. 50, special effects
 Martinez, Flavio, *Ecstasy*, Nov. p. 84
Matilda, Aug. p. 62, Stefan Czapsky
 Mayers, Michael, *Dinosaurs of the Gobi Desert*, Oct. p. 103
 Maynard, Gary, *The Water's Edge*, Feb. p. 65
 Maysles, Albert, *Hospice*, Jan. p. 75, *When We Were Kings*, Apr. p. 80
 McLaughlin, Patrick, *The Suburbanators*, Mar. p. 54
 Medina, Teresa, *Female Perversions*, Apr. p. 94
 Mellor, William C., ASC, *Giant*, Oct. p. 86
 Menges, Chris, *Michael Collins*, Oct. p. 80
 Menkes, Nina, *The Bloody Child*, Oct. p. 16
 Menzies, Jr., Peter, *A Time to Kill*, Aug. p. 72
Michael Collins, Oct. p. 80, Chris Menges
Mighty Aphrodite, Feb. p. 60, Carlo Di Palma, AFC
Millennium, Oct. p. 46, Peter Wunstorf
Mission: Impossible, Jun 42, Stephen Burum, ASC, Dec. p. 82, special effects
 Morgan, Donald M., ASC, *Ruby Ridge: An American Tragedy* (Part 2), Oct. p. 70
Movie Maker CD-ROM, Apr. p. 69, Tony Cutrone
Mulholland Falls, Apr. p. 64, Haskell Wexler, ASC, special effects
 Müller, Robby, BVK, NSC, *Breaking the Waves*, Dec. p. 18
Multiplicity, Jul. p. 52, Laszlo Kovacs, ASC
Muppet Treasure Island, Apr. p. 64
Murder One "Chapter Four", May p. 70, Aaron Schneider, Oct. p. 68
N.Y.P.D. Blue "Heavin' Can Wait", May p. 74, Brian J. Reynolds

Narita, Hiro, ASC, *James and the Giant Peach*, May. p. 54
 Niver, Kemp R., ASC, *In Memoriam*, Dec. p. 134
Nixon, Mar. p. 36, Robert Richardson, ASC
No Way Home, Nov. p. 80, Claudia Raschke
Norma Jean and Marilyn, Oct. p. 74, John Thomas
Notes from Underground, Apr. p. 88, Dan Gillham
Nutty Professor, The, Dec. p. 84, special effects
 Nykvist, Sven, ASC, career profile, Feb. p. 46
 On the Spot
 "Blowing into Town," Jan. p. 83
 "Crisp Visuals Lend Ad Extra Crunch," Jul. p. 91
 "Filmmakers Chase Down UltraWheel's Ice Cream Truck," Oct. p. 93
 "Filmmakers Freshen Glade Campaign," Aug. p. 93
 "High-Stakes Shooting," Nov. p. 92
 "Office Depot Gets Down to Business," Dec. p. 103
 "Olympic Giants," Feb. p. 91, Mar. p. 91
 "Son of Flipper," Jun. p. 129
 "Taking Stock of Light at Night," Apr. p. 103
 "Wave Running," May p. 97
 Papamichael, Phedon, *White Dwarf*, May. p. 81, *Phenomenon*, July p. 62
 Pei, Edward J., *Streets of Laredo*, May p. 82
Phenomenon, Jul. p. 62, Phedon Papamichael, Jul. p. 65, Jon Turteltaub
Picture Windows "Soir Bleu," May p. 86, Paul Sarossy, CSC
 Pienaar, Andre, CSC, SACS, *The Sadness of Sex*, Apr. p. 91
Pillow Book, The, Dec. p. 99, Sacha Vierny
 Points East
 "Digital Manipulation' Takes on Strange Meaning in *Seven Servants*," Dec. p. 113
 "Behind the Screen," May p. 107
 "Character-Based Camerawork in *The Spitfire Grill*," Sep. p. 108
 "Clocklike Precision," Jul. p. 101
 "Finding an Audience at the Fort Lauderdale Film Festival," Jan. p. 91
 "Hope and Despair in Cuba," Nov. p. 101
 "New York's Shooting Gallery: Aiming for Artistic Freedom," March p. 96.
 "Savoring the Apple's Many Flavors," Oct. p. 103
 "Sayles Concocts Authentic Tex-Mex Murder Mystery," Jun. p. 139
 "The Road to Cairo's 19th Annual Film Festival," Feb. p. 99
 "Tom Krueger Shoots *Manny & Lo*," Aug. p. 101
 Polito, Sol, ASC, *The Sea Hawk*, Jul. p. 86, Aug. p. 88
 Porath, Gideon, *The Ring*, Nov. p. 18
Portrait of Jennie, Dec. p. 106, Joseph August, ASC
 Poster, Steven, ASC, *Filmmakers' Forum*, May. p. 120
 Postproduction
 "A New Telecine Debuts From Phillips," Sep. p. 14
 "DVD: The New Digital Video Format," Jul. p. 10
 "FrameStore: From Post House to Visual Effects Facility," Nov. p. 12
 "NAB Buzz," Apr. p. 12
 "Posting Prime Visuals," Sep. p. 28
 "Shapeshifting Titles," Sep. p. 46
 "Tape Transfer: Advice and Options for Top Colorists," Feb. p. 12
 Pratt, Roger, BSC, *Twelve Monkeys*, Jan. p. 36
 Primes, Robert, ASC, *Filmmakers' Forum*, Aug. p. 112, *Harrison, Cry of the City*, Oct. p. 68
 Production Slate
 "1996 Cannes Film Festival Honorees," July p. 16.
 "Aliens: Ride at the Speed of Fright," Aug. p. 20.
 "ASC and Digital Domain Explore New Frontiers," Aug. p. 24.
 "Battie to Sway ATV Standard Heats Up As 'Coalition' Enters Fray," Sept. p. 18.
 "Birth of Nina Menkes' *The Bloody Child*," Oct. p. 16.
 "CSC Awards" June p. 22.
 "Czech Republic Provides Backdrop for *The Ring*," Nov. p. 18
 "DGA Awards," May p. 20.
 "Film Commission Updates," Feb. p. 16.

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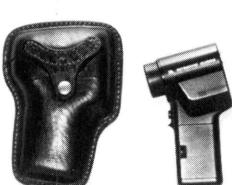
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- "Film Crew Reaches Everest's Summit," Aug. p. 22.
- "How the Midwest Won Cinerama," Dec. p. 22
- "Independent Spirit Awards," May p. 18.
- "PDI's Animation and Effects Enhance *The Arrival*," Aug. p. 26.
- "Restoration of *The Umbrellas of Cherbourg*," Sept. p. 18.
- "Restoring *The King and I*," Jun. p. 16
- "Rhythm & Hues Wins Oscar for *Babe FX*," June p. 18.
- "Semler's Techniques Add Production Speed," Oct. p. 18
- "Swimming with Piranha and the Sony DCR VX-1000," July p. 14.
- "*Swingers*' Director-Cinematographer Says 'Make Mine a Double!,'" Nov. p. 16
- "Taking Flight for *The Crow: City of Angels*," Nov. p. 22
- "The Birth of Nina Menkes' *The Bloody Child*," Oct. p. 16
- "Von Trier and Müller: Ascetic Aesthetic on *Breaking the Waves*," Dec. p. 18
- Protat, Francois, *Kabloonak*, Jan. p. 30
- Quinn, Declan, *Leaving Las Vegas*, Feb. p. 28
- Ragalyi, Elmer, *Rasputin*, Oct. p. 73
- Ransom**, Nov. p. 46, Piotr Sobocinski
- Raschke, Claudia, *No Way Home*, Nov. p. 80
- Rasputin**, Oct. p. 73, Elmer Ragalyi
- Reynolds, Brian J., *N.Y.P.D. Blue* "Heavin' Can Wait," May p. 74
- Richardson, Robert, ASC, *Nixon*, Mar. p. 36
- Ridett, Dave, Aardman Animations, Mar. p. 79
- Ridicule**, Dec. p. 104, Thierry Arbogast, AFC
- Ring, The**, Nov. p. 18, Gideon Porath
- Rocha, Claudio, *The Whole Wide World*, Apr. p. 86
- Rock, The**, Jun. p. 64, John Schwartzman
- Ruby Ridge: An American Tragedy** (Part 2), Oct. p. 70, Donald M. Morgan, ASC
- Rude**, Mar. p. 60, Barry Stone, CSC
- Ruttenberg, Joseph, ASC, *Gaslight*, Jan. p. 79
- Sadness of Sex, The**, Apr. p. 91,
- Andre Pienaar, CSC, SACS
- Sarossy, Paul, CSC, *Picture Windows "Soir Bleu"*, May p. 86
- Schneider, Aaron, *Murder One* "Chapter Four," May p. 70, Oct. p. 68
- Schwartz, Philip D., *Sharpen the Saw*, Jul. p. 26
- Schwartzman, John, *The Rock*, Jun. p. 64
- Sea Hawk, The**, Jul. p. 86 (Part I), Aug. p. 88 (Part II), Sol Polito, ASC
- Seeking the Cafe Bob**, Mar. p. 56, Todd Spencer, William Ambroico
- Seinfeld**, Oct. p. 56, Wayne Kennan, ASC
- Sellers, Brad, commercial "Blowing Into Town," Jan. p. 83
- Semler, Dean, ACS, *Trojan War*, Oct. p. 18
- Sense and Sensibility**, Jun. p. 80,
- Michael Coulter, BSC
- Seven Servants**, Dec. p. 113, Stefan Jonas
- Shanghai Triad**, Jun. p. 88, Lu Yue
- Sharpen the Saw**, Jul. p. 26, Philip D. Schwartz
- Shine**, Apr. p. 75, Geoffrey Simpson, ACS
- Simpson, Geoffrey, ACS, *Shine*, Apr. p. 75
- Sleepers**, Oct. p. 34, Michael Ballhaus, ASC
- Sobocinski, Piotr, *Ransom*, Nov. p. 46
- Space Jam**, Dec. p. 85, Michael Chapman, ASC, special effects
- Special Effects**, Aug. p. 30
- Special Venues
- "Aliens: Ride at the Speed of Fright," Aug. p. 20
- "Amazing Special Effects," Aug. p. 30
- "Digitizing the Third Dimension," Aug. p. 45
- "Future Shock," Jul. p. 38
- Spencer, Todd, *Seeking the Cafe Bob*, Mar. p. 56
- Spinotti, Dante, AIC, *Heat*, Jan. p. 46
- Spitfire Grill, The**, Sep. p. 108, Rob Draper, ACS
- Sproxton, David, Aardman Animations, Mar. p. 79
- Stapleton, Oliver, *Kansas City*, Sep. p. 34
- Star Trek: First Contact**, Dec. p. 58, Matthew F. Leonetti, ASC, Dec. p. 68, special effects
- Steadman, Robert, ASC, *The Man Who Captured Eichmann*, Dec. p. 30
- Stealing Beauty**, Jun. p. 54, Darius Khondji, AFC
- Stone, Barry, CSC, *Rude*, Mar. p. 60
- Stout, Archie J., ASC, *Fort Apache*, Jun. p. 106
- Streets of Laredo**, May p. 82, Edward J. Pei
- Suburbanators, The**, Mar. p. 54, Patrick McLaughlin
- Survivors of the Holocaust**, Jan. p. 70,
- Allan Holzman
- Suschitzky, Peter, BSC, *Mars Attacks!*, Dec. p. 40
- Sweeney, Rob, *Color of a Brisk and Leaping Day*, Apr. p. 78
- Swingers**, Nov. p. 16, Doug Liman
- Tales From the Crypt "You Murderer,"** May p. 72, Rick Bota
- Television
- "1996 Emmy Nominations Offer an Eyeful," Oct. p. 66
- "Big Moments on the Small Screen," May p. 70
- "Czech Republic Provides Backdrop for *The Ring*," Nov. p. 18
- "How to Photograph Nothing," Oct. p. 56
- "Mining the Macabre," Oct. p. 46
- "Primetime Stock Enhances the Airwaves," Oct. p. 75
- Terminator 2 3-D**, Aug. p. 38, Russell Carpenter, ASC, Aug. p. 45 special effects
- Theremin: An Electronic Odyssey**, Jan. p. 58,
- Frank DeMarco
- Thinner**, Apr. p. 30, Kees Van Oostrum, ASC
- Thomas, John, *Norma Jean and Marilyn*, Oct. p. 74
- Thorpe, Richard, *ER* "Hell and High Water," Oct. p. 67
- Toll, John, ASC, *Braveheart*, Jun. p. 74,
- Filmmakers' Forum, Aug. p. 112
- Tover, Leo, ASC, *The Lost Squadron*, Feb. p. 85
- Trainspotting**, Aug. p. 80, Brian Tufano, BSC
- Trojan War**, Oct. p. 18, Dean Semler, ACS
- Troublesome Creek: A Midwestern**, Apr. p. 76,
- Steven Ascher
- Truman**, May p. 78, Paul Elliott
- Trumbull, Mark, *The Water's Edge*, Feb. p. 65
- Tufano, Brian, BSC, *Trainspotting*, Aug. p. 80
- Twelve Monkeys**, Jan. p. 36, Roger Pratt, BSC
- Twister**, May p. 36, Jack Green, ASC, Dec. p. 76,
- special effects
- Unforgettable**, Jan. p. 52, Jeff Jur
- Up Close and Personal**, Apr. p. 46, Karl Walter Lindenlaub, BVK
- Van Oostrum, Kees, ASC, *Thinner*, Apr. p. 30
- Vertigo**, Nov. p. 86, Robert Burks, ASC
- Vierny, Sacha, *The Pillow Book*, Dec. p. 99
- Visual Effects
- "Amazing Special Effects," Aug. p. 30
- "Bluescreen/Greenscreen 101," Dec. p. 91
- "Box of Tricks," Apr. p. 64
- "Digitizing the Third Dimension," Aug. p. 45
- "Dragonheart Fulfils Filmic Quest," Jun. p. 96
- "Effecting a New Escape," Sep. p. 81
- "FrameStore: From Post House to Visual Effects Facility," Nov. p. 12
- "James and the Giant Peach Grows on the Screen," May p. 54
- "Jaw-Dropping Effects Add Heft to *The Nutty Professor*," Dec. p. 84
- "Making Mission Possible," Dec. p. 82
- "New Zealand's New Digital Age," Aug. p. 55
- "Now Playing at the Cyberplex," Apr. p. 69
- "Send in the Clones," Jul. p. 52
- "Space Jam: A Special Effects Slam-Dunk," Dec. p. 85
- "Strange Invaders," Dec. p. 50
- "Taking Flight for *The Crow: City of Angels*," Nov. p. 22
- "The End of the World as We Know It," Jul. p. 43
- "The Right Virtual Stuff," Apr. p. 54
- "Twister Kicks Up a Storm," Dec. p. 76
- "Virtual Camera Movement: The Way of the Future?," Sep. p. 93
- "Welcome to the Jungle," Feb. p. 73
- "Where No Trek Has Gone Before," Dec. p. 68
- Waite, Ric, ASC, *Andersonville*, Oct. p. 72
- Waller, Gary, commercial "NYNY Hotel/Casino," Nov. p. 92
- Water's Edge, The**, Feb. p. 65, Gary Maynard, Mark Trumbull
- Welcome to the Dollhouse**, Apr. p. 74, Randy Drummond
- When We Were Kings**, Apr. p. 80, Albert Maysles, Kevin Keating, Maryse Alberti, Paul Goldsmith, Roderick Young
- White Dwarf**, May p. 81, Phedon Papamichael
- White Squall**, Feb. p. 36, Hugh Johnson
- Whole Wide World, The**, Apr. p. 86, Claudio Rocha Williams, Billy, BSC, Hungarian Seminar, Feb. p. 81
- Wojciechowski, Michael, *The Killing Jar*, Mar. p. 68
- Wolski, Dariusz, ASC, *Crimson Tide*, Jun. p. 84,
- The Fan, Sept. p. 54
- Wunstorf, Peter, *Millennium*, Oct. p. 46
- X-Files "731," The**, May p. 72, Oct. p. 68, John S. Bartley, CSC
- Young, Roderick, *When We Were Kings*, Apr. p. 80
- Yue, Lu, *Shanghai Triad*, Jun. p. 88
- Zsigmond, Vilmos, ASC, Hungarian Seminar, Feb. p. 81,
- The Ghost and the Darkness*, Nov. p. 34
- Zunder, Kenneth D., ASC, *Chicago Hope* "Leave of Absence," May. p. 76, Oct. p. 66

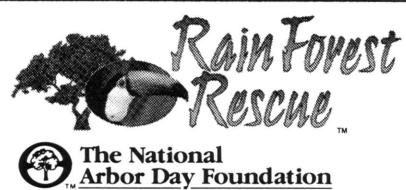
Index by Author

- Ashton, Stephen, "Phenomenon Dazzles the Eye," Jul. p. 62
- "Rude Awakening," Mar. p. 60
- "Strangers in the Snow," Jan. p. 30
- "Unusual Offerings Highlight Toronto Film Festival," Feb. p. 16
- Bailey, John, ASC, "Can We Save the Shot?," Jan. p. 12
- "Scouting the Past," Sep. p. 119
- Beacham, Frank, "Archivists Warn: Don't Depend on DAT," Aug. p. 14
- "Breakthrough in Flat-Panel Displays," Apr. p. 115
- "Personal Video Comes of Age," Mar. p. 12
- "Electronic Cinematography: Round Three," Jan. p. 14
- "The Virtual Studio," Dec. p. 14
- "The Wired Living Room," Sep. p. 12
- "Video's Image-Quality Debate," Jun. p. 10
- Behlmer, Rudy, "The Sea Hawk Sets Sail (Part 1 of 2)," July. p. 86, "(Part 2 of 2)," Aug. p. 88
- Bennett, Richard, "'Peach Cam' Brings a Little New Technology to an Old Technique," May. p. 60
- Bergery, Benjamin, "Henri Alekan: The Doyen of French Cinematography," Mar. p. 46
- "Imaging the Impossible," Jun. p. 42
- Bertrand, Merle, "One from the Heart of Texas," Mar. p. 56
- Bruno, Marc, "Giving Back to Dorothy Day," Mar. p. 73
- Clark, Curtis, ASC, "Net Gains in Cyberspace," Mar. p. 112
- Comer, Brooke, "Behind the Screen," May p. 107
- "Character-Based Camerawork in *The Spitfire Grill*," Sep. p. 108
- "Clocklike Precision," Jul. p. 101
- "Digital Manipulation Takes on Strange Meaning in *Seven Servants*," Dec. p. 113
- "Finding an Audience at the Fort Lauderdale Film Festival," Jan. p. 91
- "Hope and Despair in Cuba," Nov. p. 101
- "Hospice Offers Hope," Jan. p. 75
- New York's Shooting Gallery: Aiming for Artistic Freedom," March p. 96.
- "Restoring *The King and I*," Jun. p. 16
- "Savoring the Apple's Many Flavors," Oct. p. 103
- "Sayles Conccts Authentic Tex-Mex Murder Mystery," Jun. p. 139
- "The Road to Cairo's 19th Annual Film Festival," Feb. p. 99
- "Tom Krueger Shoots *Manny & Lo*," Aug. p. 101
- "Unifying A Visual Truth," Jan. p. 63
- Davenport, Richard J., "One Drink Minimum," Feb. p. 28
- Erbach, Karen, "Turtletaub Takes New Visual Turn," Jul. p. 65

- Ferraro, Michael X., "Days of Wine and Hypnosis," Mar. p. 68
"Escape Artists," Sep. p. 76
"Global Village Idiot," Jul. p. 77
"Sundance '96: Of Cell Phones and Celluloid," Apr. p. 74
Fisher, Bob, "ASC Salutes Sven Nykvist," Feb. p. 46
"Blue-Chip Stocks: Kodak's Vision Films," Sep. p. 70
"Enhancing the Palette: Tiffen Digital Filters," May. p. 65
"Hitting the Shots on Eddie," Jun. p. 32
"Minting a Screen Version of American Buffalo," Feb. p. 52
"Space Jam: A Special Effects Slam-Dunk," Dec. p. 85
Gach, Gary, "John Alton: Master of the Film Noir Mood," Sep. p. 87
Gainsborough, John, "Aardman Animations: A Perpetual Stop-Motion Machine," Mar. p. 79
"Black-and-White All Over," Nov. p. 75
Gallagher, John Andrew, "China Seas: An All-Star Trip," May p. 92
Gentry, Ric, "A Splintered Vision of America," Mar. p. 36
George, Ed, "Swimming with Piranha and the Sony DCR VX-1000," July p. 14.
Hardesty, Mary, "Blowing into Town," Jan. p. 83
"Crisp Visuals Lend Ad Extra Crunch," Jul. p. 91
"Filmmakers Chase Down UltraWheel's Ice Cream Truck," Oct. p. 93
"Filmmakers Freshen Glade Campaign," Aug. p. 93
"High-Stakes Shooting," Nov. p. 92
"Office Depot Gets Down to Business," Dec. p. 103
"Olympic Giants," Feb. p. 91, Mar. p. 91
"Son of Flipper," Jun. p. 129
"Taking Stock of Light at Night," Apr. p. 103
"Wave Running," May p. 97
Harrell, Alfred D., "Now Playing at the Cyberplex," Apr. p. 69
Henderson, Jan Alan, "Joseph August, ASC's Swan Song: *Portrait of Jennie*," Dec. p. 106
Heuring, David, "1996 Emmy Nominations," Oct. p. 66
"Primetime Stock Enhances the Airwaves," Oct. p. 75
"Sharpen the Saw: Ingenuity and Experience Fuel First Feature," Jul. p. 26
Kalish, Karen, "Film Preservation: A Practical Guide," Jun. p. 123
Kaufman, Debra, "A New Telecine Debuts From Phillips," Sep. p. 14
"DVD: The New Digital," Jul. p. 10
"Frame Store: From Post House to Visual Effects Facility," Nov. p. 12
"NAB Buzz," Apr. p. 12
"Posting Prime Visuals," Sep. p. 28
"Tape Transfer: Advice and Options for Top Colorists," Feb. p. 12
Lueker, Rob, "At the Masters' Feet," Feb. p. 81
Magid, Ron, "Amazing Special Effects," Aug. p. 30
"Box of Tricks," Apr. p. 64
"Digitizing the Third Dimension," Aug. p. 45
"Dragonheart Fulfils Filmic Quest," Jun. p. 96
"Effecting a New Escape," Sep. p. 81
"James and the Giant Peach Grows on the Screen," May p. 54
"Jaw-Dropping Effects Add Heft to The Nutty Professor," Dec. p. 84
"Making Mission Possible," Dec. p. 82
"New Zealand's New Digital Age," Aug. p. 55
"Strange Invaders," Dec. p. 50
"The End of the World as We Know It," Jul. p. 43
"Twister Kicks Up a Storm," Dec. p. 76
"Welcome to the Jungle," Feb. p. 73
"Where No Trek Has Gone Before," Dec. p. 68
Menkes, Nina, "The Birth of Nina Menkes' The Bloody Child," Oct. p. 16
Oppenheimer, Jean, "Revolutionary Images," Oct. p. 80
"An Unforgettable World of Light and Shadow," Jan. p. 52
"Down Under in Jungleland," Sep. p. 44
"Romance on the Air," Apr. p. 46
"Shapeshifting Titles," Sep. p. 46
"Von Trier and Muller: Ascetic Aesthetic on Breaking the Waves," Dec. p. 18
Pfefferman, Naomi, "Making a Splash," May p. 46
"Music from Another World," Jan. p. 58
"Taking the Stand," Aug. p. 72
Pizzello, Chris, "Bedlam on the Basepaths," Sep. p. 54
"Bringing the Dark Side of Character to Light in Diabolique," Apr. p. 36
"How to Photograph Nothing," Oct. p. 56
Pizzello, Stephen, "A Dystopian Trip Through Time," Jan. p. 36
"Arri Illuminates British Contingent," Oct. p. 28
"Book Smart," Aug. p. 62
"Sundance '96: Of Cell Phones and Celluloid," Apr. p. 74
Porath, Gideon, "Czech Republic Provides Backdrop for The Ring," Nov. p. 18
Poster, Steven, ASC, "Filtering Out the Nonsense," May p. 120
Primes, Robert, ASC, "ASC Members Riposte Variety Article," Aug. p. 112
"Battle to Sway ATV Standard Heats Up As Coalition Enters Fray," Sept. p. 18.
Probst, Christopher, "1996 Sci-Tech Awards," May. p. 87
"ASC Stages Bat-Dinner at Clubhouse," Apr. p. 127
"Big Moments on the Small Screen," May. p. 70
"Bluescreen/Greenscreen 101," Dec. p. 91
"Cinematic Transcendence," Jun. p. 74
"Cold-Blooded Scheming," Mar. p. 28
"Future Shock," Jul. p. 38
"Mining the Macabre," Oct. p. 46
"The Eye Behind the Lens," Nov. p. 67
Robley, Les Paul, "Aliens: Ride at the Speed of Fright," Aug. p. 20
"Attack of the Vinegar Syndrome," Jun. p. 111
"Hot Set," Jan. p. 46
"Send in the Clones," Jul. p. 52
Rudolph, Eric, "Jazzed Up," Sep. p. 34
"Mighty Aphrodite Tours Manhattan," Feb. p. 60
"Ransom Ups the Ante," Nov. p. 46
"Restoration of The Umbrellas of Cherbourg," Sep. p. 18
"The Rock Offers No Escape," Jun. p. 64
"Run-and-Gun Style Propels Eraser," Jul. p. 69
Seidenberg, Lisa, "IDC/2 Takes Stock of Documentaries," Jan. p. 18
Steadman, Robert, ASC, "Argentine Diary," Dec. p. 30
Steen, Russell, "Top of the Charts," Mar. p. 85
Szabin, Fredrick C., "Lean and Mean," Apr. p. 30
Taylor, Dayton, "Virtual Camera Movement: The Way of the Future?," Sep. p. 93
Terry, Cliff, "Kartemquin: A Different Kind of Dream Factory," Apr. p. 98
Thompson, Andrew O., "1996 Emmy Nominations," Oct. p. 66
"A Cinematic Melting Pot," Dec. p. 99
"Battling the Borg," Dec. p. 58
"How the Midwest Won Cinerama," Dec. p. 22
"Magic Bus," Nov. p. 56
"Trains, Veins and Heroin Deals," Aug. p. 80
"Vicious Cycle," Sep. p. 62
Toll, John, ASC, "ASC Members Riposte Variety Article," Aug. p. 112
Trumbull, Mark, "Racing Along The Water's Edge," Feb. p. 65
Turner, George, "Dust and Danger at Fort Apache," Jun. p. 106
"Gaslight Twice Told (Part 2 of 2)," Jan. p. 79
"Giant Still Towers," Oct. p. 86
"Hitchcock's Acrophobic Vision," Nov. p. 86
"Rediscovering The Lost Squadron," Feb. p. 85
"Revenge Served Cold," Oct. p. 34
"In Memoriam: William J. Clothier, ASC," Mar. p. 108
"In Memoriam: Joseph Biroc, ASC," Nov. p. 112
"In Memoriam: Richard A. Kelley, ASC," Jan. p. 102
"In Memoriam: Hugh K. Gagnier, ASC," Mar. p. 109
"In Memoriam: Kemp R. Niver, ASC," Dec. p. 134
Wiener, David, "A Testament to Tragedy," Jan. p. 70
"Chasing the Wind," May p. 36
Williams, David E., "1996 Emmy Nominations," Oct. p. 68
"A Passion for Color," Jun. p. 54
"An Economy of Sarcasm," Mar. p. 54
"Galactic Antics," Dec. p. 40
"Honoring Unique Visions," Nov. p. 80
"New Zealand's New Digital Age," Aug. p. 55
"Night of the Hunters," Nov. p. 34
"Scared Silly," Aug. p. 52
"Semler's Techniques Add Production Speed," Oct. p. 18
"Stormy Weather," Feb. p. 36
"The Art of Darkness," May p. 30
"The Right Virtual Stuff," Apr. p. 54
"Transforming Super 8," Nov. p. 28
"Von Trier and Muller: Ascetic Aesthetic on Breaking the Waves," Dec. p. 22
"Worlds at War," July p. 32
Wilson, Brandon, "Swingers' Director-Cinematographer Says 'Make Mine a Double!,'" Nov. p. 16

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American Cinematographer

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Attn: Back Issues

In Memoriam

Kemp R. Niver, ASC, award-winning film technician, documentary producer, historian and teacher, died October 15 at the Country Villa Nursing Center in Los Angeles. He would have been 85 on October 17. Niver was a man of many accomplishments, but the one for which he is most noted is the restoration to film of the Library of Congress paper print collection. He accomplished this feat using his own Renovare process. (*Renovare* is Latin, meaning "make new again.")

"My interest in the motion picture field is primarily in the collection and restoration of pre-World War I films," Niver wrote in 1958 upon his acceptance into the ASC. "I was fortunate to be allowed to work out the photographic problems for the Library of Congress in connection with a project sponsored by the Academy of Motion Picture Arts and Sciences that had to do with the old bromide paper films that were made from master negatives prior to the advent of the Motion Picture Copyright Law."

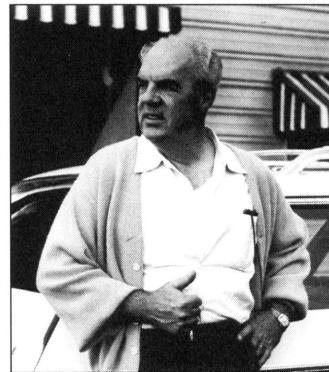
Bromide paper copies possessing the same width and length as original film negatives were the only way film producers could copyright their movies (as strips of individual photographs) in the cinema's early years. In the late 1930s barrels of the battered paper rolls were discovered in the basement of the Library of Congress. In 1950 Niver took on the job of assembling and restoring the prints to film. As there were no standards for film widths or sprocket perforations on the early films, Niver invented his "figment" printer to accommodate any size of film.

The revived collection consists of over 300 films dating from 1889 to 1900, and over 3,000 films from 1900 to 1915, which include most of the films made by the following companies: Biograph, New York Motion Picture Co. in California, Méliès, Kessel & Baumann,

Lubin, Edison, and many others.

Among the pictures Niver rescued were 25 of D. W. Griffith's works and all of Mary Pickford's early films.

Niver wrote 11 books dealing with the nascent days of the movies, all of which have provided research for other film historians.



These include "Motion Pictures From the Library of Congress Paper Print Collection, 1894-1912;" "Mary Pickford, Comedienne;" and "D. W. Griffith: His Biographical Films in Perspective."

Born in Los Angeles, Niver was the son of a Los Angeles policeman. His interest in photography began when he took an air cameraman's course in connection with Naval aviator's instruction at Great Lakes and Pensacola. He had, as he put it, "Naval experience in every theater, all oceans." He earned the rank of Commander after commanding a destroyer and a salvage tug. Prior to his work in the motion picture field, he spent 12 years in the District Attorney's office and as an investigator for the Federal Government and the State of California. He was also the head of security for a movie studio.

The AMPAS awarded Niver an Oscar in 1954 for developing Renovare. The ASC honored him with the President's Award for Outstanding Achievement in 1991. In 1994 he received the Governor's Award from the SOC and in 1987 the IDA Preservation and Scholarship Award.

A member of AMPAS and the International Museum of Photography at Eastman House, Rochester, NY, he was also a fellow of the Photographic Historical Society of New York, and a life fellow of the SMPTE. He was the curator of the ASC clubhouse museum, and a technical consultant to many film studios.

Niver is survived by a granddaughter, Tara Candoli, of Los Angeles. At his request there were no services. ♦

From the Clubhouse

Ahern II Joins the ASC

The ASC's newest member is Lloyd Ahern II. As a youth, Ahern had visited many film sets with his father, but his first official industry job was in the loading room of CBS Studio Center. He then worked under Harry Stradling Jr. (later ASC) as a second assistant on the TV series *Gunsmoke*. During his tenure on this Western, Ahern became acquainted with future director Walter Hill, who at the time was passing out the production's call sheets. After progressing to camera operator some years later, Ahern became cinematographer on the TV series *Simon and Simon*; Vincent Martinelli, ASC had chosen to alternate photography with him on a weekly basis. After shooting the pilot *On the Edge*, the series *Eddie Dodd* and numerous television movies, Ahern was made director of photography on Walter Hill's *Trespass*. He has also collaborated with the director on the Westerns *Geronimo*, *Wild Bill* and *Last Man Standing*. He recently completed photography on the upcoming Ray Liotta action thriller *Turbulence*.



Roizman to Receive ASC Lifetime Achievement Award

Owen Roizman has been named the recipient of the ASC's 1997 Lifetime Achievement Award. Roizman has been nominated five Oscars for cinematography in three consecutive decades — for the *The French Connection*, *The Exorcist*, *Network*, *Tootsie* and *Wyatt Earp*.

Notes ASC President Victor Kemper, "The ASC Lifetime Achievement Award is presented to an individual who has compiled an enduring body of work that has made significant contribution to advancing the art of filmmaking. Owen Roizman is an innovative artist who is still in the prime of his career. His best work is still ahead of him, but he has already made immeasurable contributions to the cinematographic art and its impact on narrative storytelling. There is no point in waiting to present him with a lifetime achievement award."

Roizman's immense body of work includes such films as *Three Days*

of the Condor, *The Taking of Pelham, One, Two, Three*; *The Return of a Man Called Horse*, *The Electric Horseman*, *The Heartbreak Kid*, *Play It Again Sam*, *Taps*, *The Stepford Wives*, *Straight Time*, *Sgt. Pepper's Lonely Hearts Club Band*, *Havana*, *True Confessions*, *Absence of Malice*, *Grand Canyon*, *The Addams Family* and *French Kiss*.

Says Roizman, "I was both shocked and thrilled when I was notified that my colleagues had selected me for this tribute. I believe this is the greatest honor you can earn as a cinematographer, because it comes from your peers, who truly understand what you are trying to accomplish. There are cinematographers who are older and have been around longer than I have, so I never dreamed this would happen now."

The award will be presented to Roizman on February 23, 1997 at the 11th Annual ASC Outstanding Achievement Awards at the Century Plaza Hotel. An overview of the cinematographer's career will be featured in the February issue of *American Cinematographer*.



Poster Addresses CSC

While in Toronto shooting the Showtime feature *The Color of Justice*, Steven Poster, ASC spoke at a Canadian Society of Cinematographers panel discussion entitled "Film Versus Video" at Showbiz Expo Canada on September 7. In addressing the differences between the two mediums, Poster recalled a 1990 test he did for NHK in Japan on its high-definition video system. Besides the obvious compositional discrepancies (chemical versus electronic), Poster emphasized that "the difference is perceptual."

Said Poster, "In film, what we have is far more audience participation in understanding an image. You are forced to pay attention to what's going on, and your mind then interpolates those [inherent] flaws [of the medium] into completing the image — the time in-between the frames when there's nothing on. Film creates a 'hot medium' where the audience is much more involved in the image. Video, however, works at that same refresh rate, and we find that it is a direct transfer of image

from the optic nerve to the brain.

"Most forms of reality-based information tend to do better with a viewing audience than do film images, such as news, live broadcasts, sporting events, music specials and current documentaries. What is film better for? Anything that's fantasy based, storytelling or historical in nature. In fact, soap operas were tried for a while on film, but they didn't do very well because the concept with a soap opera is to have those people right in your home with you." Concluded



Poster, "We can make film look like video; you could actually shoot a one-to-one image on film at 30 frames a second and transfer it at 30 frame per second, and it starts to look like video. Whether you would want to or not, I would never know."

— Don Angus, CSC



ASC Members Go Line-Dancing

The "Meet the New Members" Meeting on Saturday, October 19 took the ASC Clubhouse by storm with a country-western theme night complete with cocktails, a chuck-wagon barbecue and line-dancing galore. New ASC members James Bagdonas, Victor Goss, Gil Hubbs and Tim Suhrstedt strutted their stuff, much to the delight of their colleagues.

Above: Roscoe Farnsworth and his dance lead Victor Goss; Ron Garcia and wife Peggy King; Claire and Victor Kemper; Gil and Ann Hubbs; and Bob Primes through a litany of foot-stomping antics. Left: New members Suhrstedt, Bagdonas, Goss and Hubbs hold their hats, and the ASC, close to their hearts.



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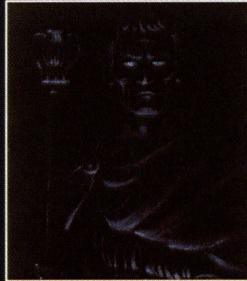


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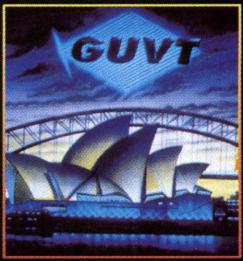
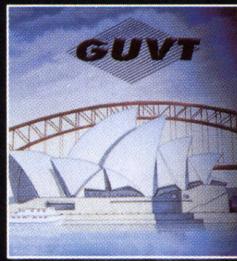
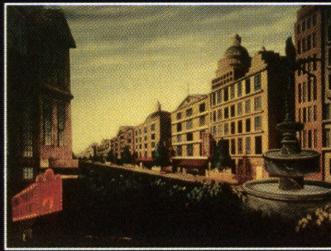
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